

APRIL 12, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

AUTOMATION



No. 3 in 1954 Management Series

AUTOMATION:

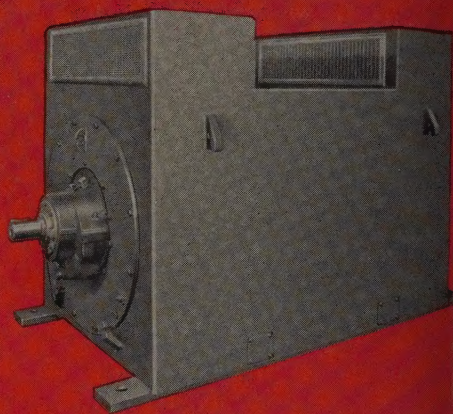
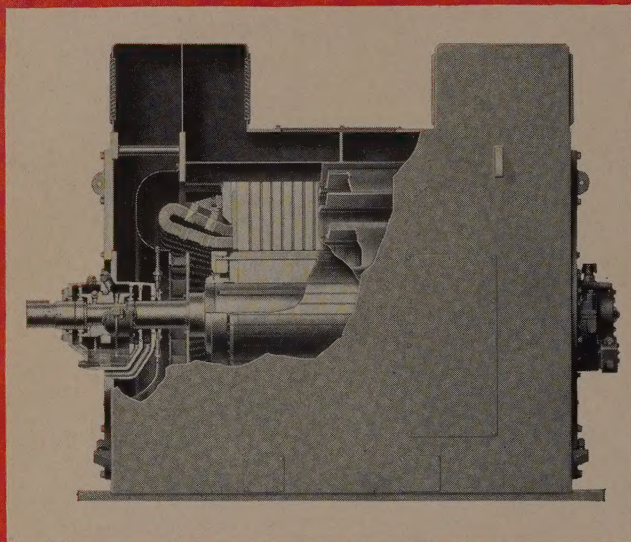
HOW FAR SHOULD YOU GO?

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Redesigned

INSIDE AND OUT



ALLIS-CHALMERS
Large 2-Pole Cage
MOTORS

New features improve 2-pole motors long known for reliability and low maintenance.

New ventilating arrangement features top air intake and discharge *plus* spiral stator core ventilation. Top intakes (available with filters) keep motor clean and make motor room cleaning easy; top discharge adds to personnel comfort. Spiral ventilation — used in turbine generators — assures even internal cooling . . . combines with centrifugal fans and baffled air passages to reduce noise.

Improved bearing design simplifies maintenance, prevents oil leakage. Capsule-type housings — proved in use on other designs — permit inspection of windings without exposing bearings. Oil leakage is prevented by a combination of features, including orifice-metered oil flow, weirs to maintain correct oil

level, labyrinth seals, breathers, and annular pressure chambers with atmospheric relief.

Clean-cut appearance is gained by providing internal space for stator and auxiliary leads, etc.

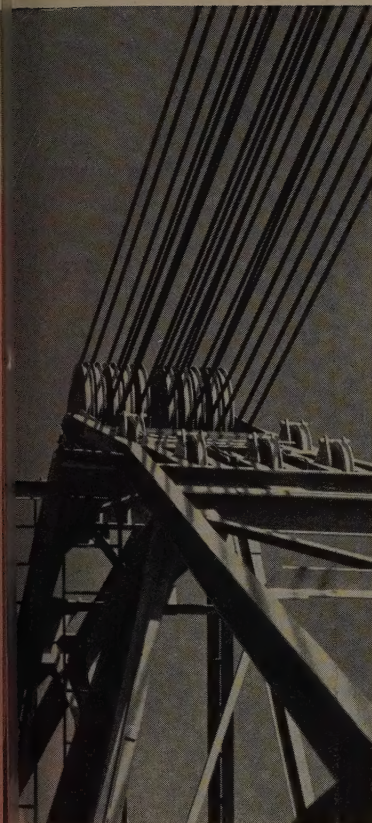
Features that helped build the Allis-Chalmers 2-pole motor reputation for reliability are retained in the new design. These include proven stator coil design, ample stator coil end bracing, thermally and mechanically stable cage assembly, separate balancing rings, and oxygen-free dew-drop cage bars.

This design available in ratings 900 hp and larger. Ask your A-C representative for Bulletin 05R8123. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4349

ALLIS-CHALMERS



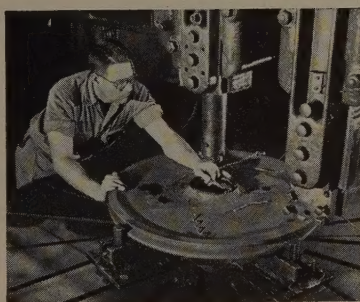


Strength at the 43 Sheave Points

The two upper photos show points above the deck of a 50-ton float crane. This huge equipment, including both crane and seagoing barge, built by Wiley Manufacturing Company, Port Deposit, Md. It can be towed for long distances, even across the ocean if need be.

In view of the heavy loads to be handled, the Wiley designers foresaw the importance of rugged steel sheave wheels — sheaves that would last a long time under the heavy pressures of the cables. In making their choice, they selected Bethlehem forged-and-rolled sheave-wheel blanks, which were furnished rough-machined. This particular job required 43 sheaves ranging from 20½ to 40 in. OD.

Sheave wheels, of course, are but one of the many uses for Bethlehem



circular blanks. These sturdy steel products, available in a large number of sections and sizes, are excellent for gears, crane wheels, flywheels, turbine rotors, industrial wheels, and many other parts requiring high strength without excessive weight.

If you haven't used Bethlehem blanks in your own operations, we

suggest you give them a try. Sizes run from 10 to 42 in. OD, and the blanks can be furnished untreated or heat-treated, as desired.

Why not ask for details? Write or phone today, and we'll gladly furnish complete information.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

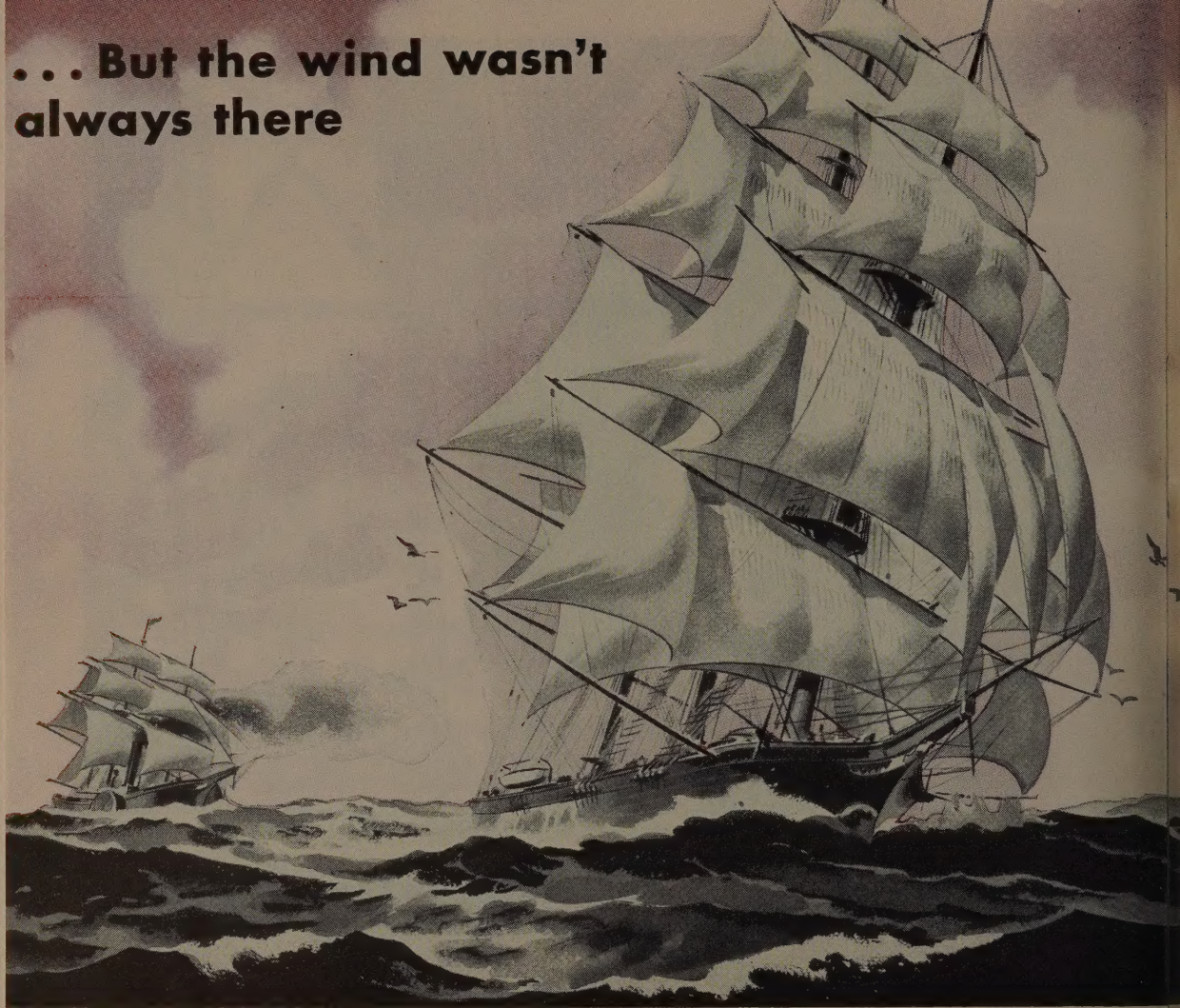


On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM FORGED-and-ROLLED CIRCULAR BLANKS

... But the wind wasn't
always there



IN THE Clipper ship era of the 1840's 20 knots with a favoring wind was considered good time — as indeed it would be today. But the wind wasn't always there. In the long run steam won out in the competitive race.

We say, "That's progress" but it's really competition which makes the difference between historic failures and continuing success. In the case of the Clippers something better, more dependable came along — and it will always be that way.

Like everyone else in today's highly competitive market you're certainly looking for new ways to improve product quality and cut manufacturing cost. Very possibly we here at Heald can help. Heald automatic sizing, constant feed throttling, centerless grinding, faster cycles, versatility, transfer type Bore-Matics, battery type equipment and a host of other unique Heald features for faster,

better precision finishing are available for a wide variety of jobs. We would welcome the opportunity to show you how a fresh Heald viewpoint can help — on long or short runs, single or multiple purpose setups.

Competition is wonderful when you're ahead of it. Our business is to keep you there. That's why IT PAYS TO COME TO HEALD.



THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

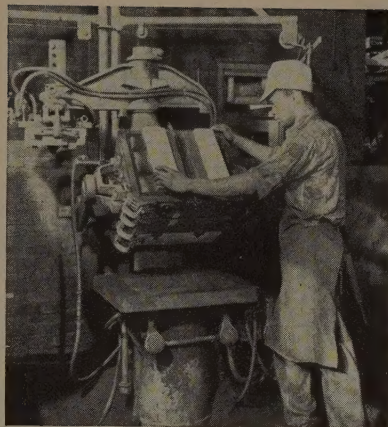
Offices in Chicago • Cleveland • Dayton
Detroit • Indianapolis • New York

Internal and Rotary Surface Grinding Machines and Bore-Matics

Efficiency is improved...

fatigue minimized

by mechanically handling large molds with Osborn Rota-Lifts at this prominent Midwestern foundry. One molder and one machine now do work formerly requiring two men, to cut foundry molding costs.



Foundry costs are less

because ***Rota-Lift*** doubles output per mold



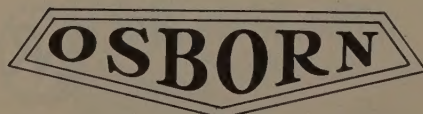
HERE'S a picture of a foundry molder turning out *twice the former production*...yet with less than half the effort.

The Osborn Rota-Lift he's using takes all heavy manual work from rolling over and handling the mold. The molder can now use larger flasks . . . each flask produces twice as many castings.

It will pay you to have Osborn study your molding operations. Undoubtedly your Osborn representative will find where production can be simplified and manhours used more efficiently through new and improved Osborn developments in molding and core blowing. Call or write The Osborn Manufacturing Company, Dept. EE-17, 5401 Hamilton Avenue, Cleveland 14, Ohio.

**See Rota-Lift at
THE FOUNDRY SHOW
Booth 1115**

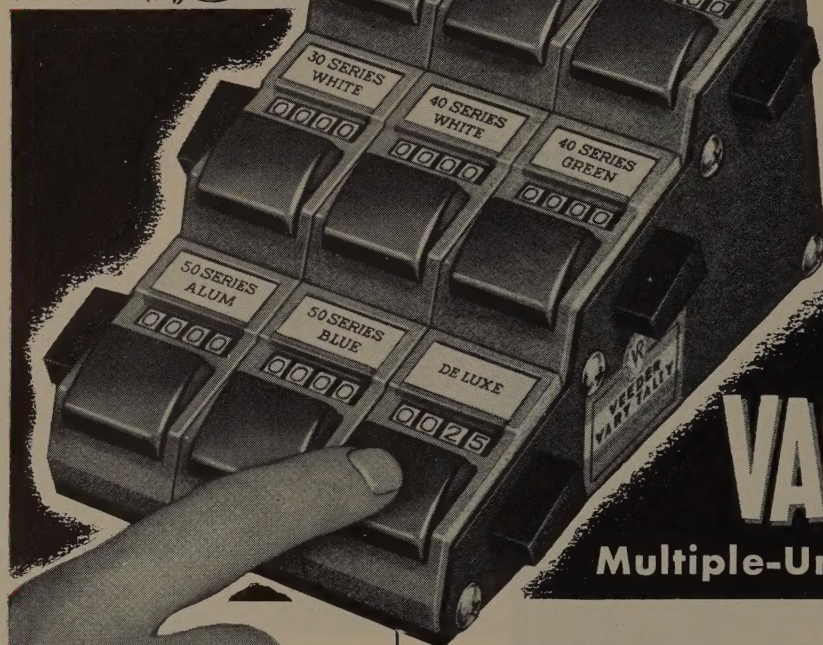
Another example of
Osborn leadership
and advanced engineering



MOLDING MACHINES

CORE BLOWERS

Fast Movers or Shelf Warmers?



Count
BOTH

(and 1,001 Other Items)

WITH

VARY-TALLY

Multiple-Unit Reset Counter

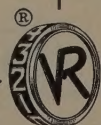
Vary-Tallies help you separate the sheep from the goats, the big ones from the little ones, the red ones from the green ones — in manufacturing, sales, accounting, researching and what not!

Vary-Tallies will do *any* counting job you want in any combination up to 6 banks high, 12 units wide (with a minimum of 2 units wide). Yes, you can count on 'em or with 'em *to your profit* — note these features of construction:

- Easily Readable from Any Angle . . . Bold figures Always Centered in Window . . . No Glare . . . Figures not Covered by Fingers in Operation
- Easily Portable, yet Ruggedly Built for Long Wear
- All Parts Corrosion-Resistant; Working parts of Hardened Steel
- Separate Counting Units Can be Rotated like Tires on a Car, to Distribute Wear Evenly
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- Individual Tag Above Each Counter-Window — Not Strip Tabs
- Veeder-Root Quality in Every Part

How Can the Vary-Tally count for you? Write for news sheet and prices.

'The Name that Counts'



VEEDER-ROOT INC.

HARTFORD 2, CONNECTICUT

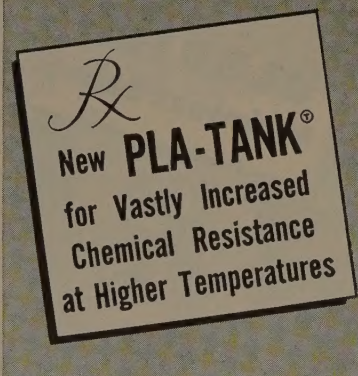
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Editorial, Business Staffs—16. Advertising Index—178. Editorial Index available semi-annually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.



Polyesters by Prescription

NOW . . . The Chemical Corporation research and development program makes possible a "prescription" type of PLA-TANK formulation for *specific problems*. It is literally possible for our technical service engineers to prescribe one of a number of vastly improved combinations of PLA-TANK material for liquid contact applications never before considered suitable for ordinary polyester plastics.

For example, tests prove that all *new* PLA-TANK electro-platers' tanks now offer far better performance on hot sulphuric, nitric, phosphoric and chromic acid solutions than any other commercially available fiber glass tank.

Remember — All Polyesters are not Alike

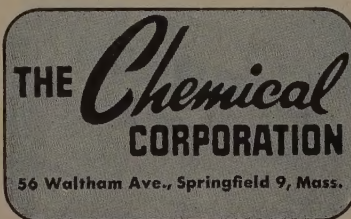
PLA-TANK achieves these vastly improved resistances by carefully controlled variations in either the resin or fiber or both. Now more than ever "*all polyesters are not alike*" and **COMMONLY PUBLISHED STUDIES OF POLYESTER PERFORMANCE MUST NOT BE APPLIED TO PLA-TANK SPECIAL MATERIALS.**

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NOW . . . you can "prescribe" new PLA-TANK for your own *specific* needs, knowing your tanks will have increased usefulness and longer life.

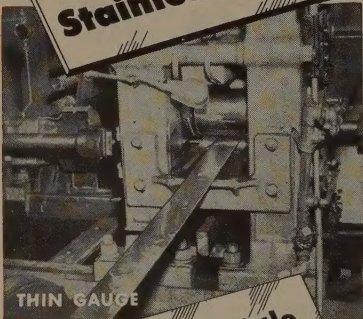
Benefit from continuous research and development with PLA-TANK — first in the field, and still the leader.

WRITE TODAY — mentioning your requirements, for complete data sheets on new PLA-TANK material.



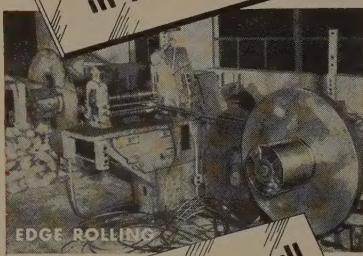
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year \$7.50; two years \$15; all other countries, one year \$20. Single copies (current issues) 50 cents. Metalworking Yearbook issue \$2.00. Entered as second class matter at the post-office in Cleveland, under the Act of March 3, 1879. Application is pending for acceptance under 39.46 P. L. & R. Copyright 1954 by Penton Publishing Co.

ULBRICH
Stainless Steels



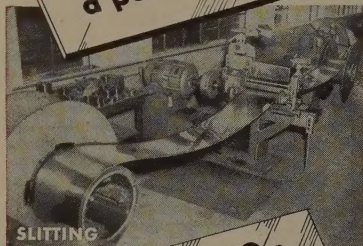
THIN GAUGE

**The BIGGEST Little
Converting Mill
in the Country**



EDGE ROLLING

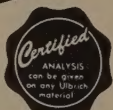
**Specialists in small
orders—a foot or
a pound and up**



SLITTING

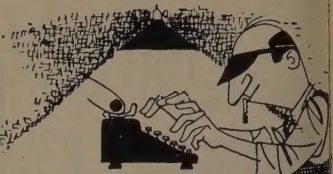
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Flat Wire-Converted
to your exact
requirements**

Complete Inventory—
Delivery from Stock



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Stainless Steels
WALLINGFORD, CONN.
Phone: Wallingford 4-7771

behind the scenes



Private Snow Storms

The Geneva Works of the United States Steel Corp. at Provo, Utah, has achieved a distinction rare among plants of its kind . . . the ability to create its own snow storms.

For three days in a row, we are told, a light snowstorm occurred over the plant, although no snow was reported anywhere else in the general locality.

A Provo weather observer theorized that the freak condition was probably the result of the three-day fog in the area, combined with heat, steam and gasses from the plant. He described the phenomenon as a "local" storm.

A Little Gem

Further to the idea of moving more products faster is this poem we happened across on our reading the other p.m.

The constant drip of water wears away the hardest stone,
And the constant gnaw of Towser masticates the toughest bone,
And the constant, cooing lover carries off the blushing maid,
And the constant advertiser is the one who gets the trade.

—Advertisers' Digest

Dollar-Wise, Weld-Foolish

Hey! Did you read the one about the \$300,000 robbery engineered by a couple of welding-wise burglars? Happened in Seattle on Washington's birthday, no less.

Seems the safesmiths used drills which had been lengthened by welding on extensions of a special-purpose, high-strength alloy.

Irving Shaff, district engineer for the Eutectic Welding Alloys Corp., identified the weld material as EutecRod 16 FC. His information narrows the field and may materially assist the FBI in finding its men.

Shaff pointed out that the welding job had been done by amateurs. EutecRod 16 was designed for high-strength joints up to 100,000 psi. To join shanks to drills, a simple butt joint would have been adequate. The fact that the joints had been beveled and the alloy used as a filler metal was a clear indication of a lack of

knowledge of this particular alloy. Furthermore, it is unlikely that a professional would have left the job as rough and unfinished as these were.

The federal men are now following up this lead as an entirely new line of investigation. If the burglars did the welding themselves, they must have purchased the material from a distributor or user. If they had the job done, they struck on a spot welder unfamiliar with the correct welding procedure.

Crime doesn't pay. Neither does sloppy welding!

Reprints Available

In today's issue is the final installment in a series of three articles on the pros and cons of leasing. During the past two weeks, our editors have been receiving numerous requests for reprints of this series. They are currently making arrangements to package the trio for those of you who want them.

If leasing is an issue the folks in your plant are currently studying, these articles can help you answer many of the questions which will come up in your discussions.

We are told that if you address your requests to STEEL's Reader Service Department, the number of reprints you require will be sent sometime around Apr. 21.

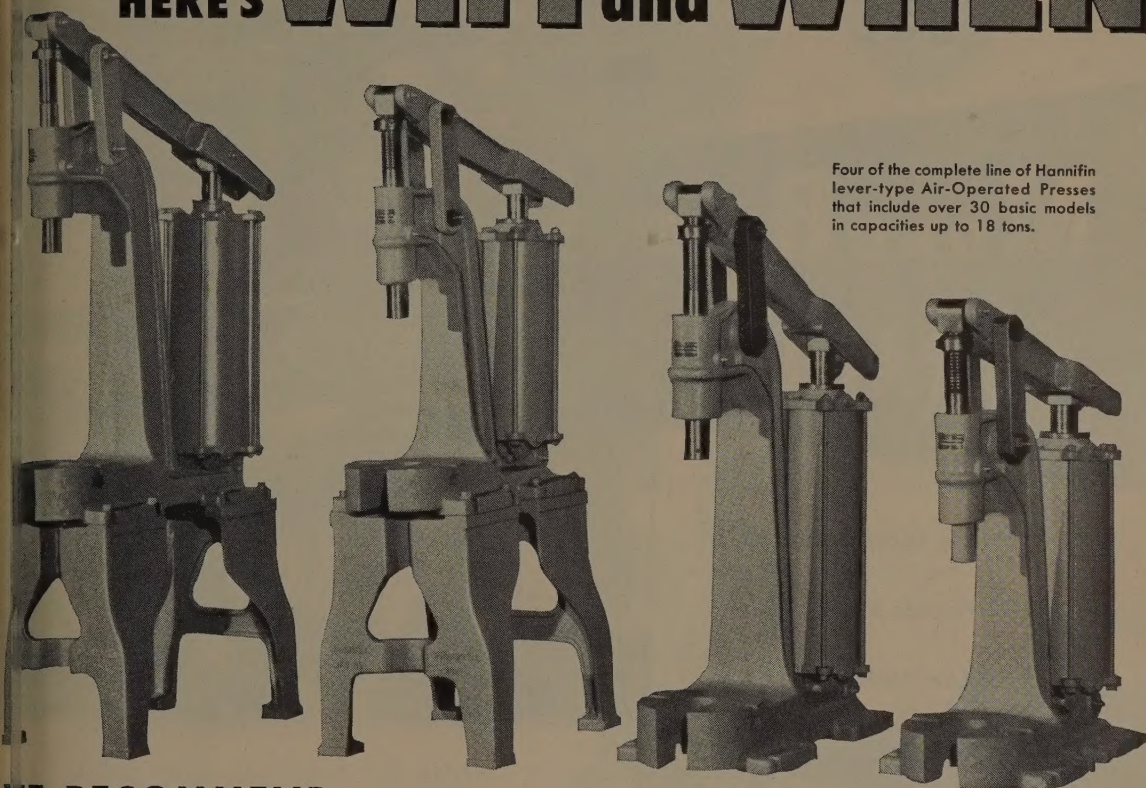
The Snafued Sniffer

Down at Kaiser Metal Products Inc. in Bristol, Penn., they tell the one: Among the company's products, which range from bathtubs to airplane airframe sections, are aluminum wingtip fuel tanks for jet aircraft. As these must be entirely free of leaks, Freon gas is pumped into the tanks under pressure and a gas detector, called a "sniffer," is used to detect possible leaks.

Not too long ago, a container of carbon tetrachloride was upset in the area. The sensitive "sniffer" practically sniffed itself wild trying to find the little leaks that weren't there. So did the inspectors.

Shradu

HERE'S **WHY** and **WHEN**



Four of the complete line of Hannifin lever-type Air-Operated Presses that include over 30 basic models in capacities up to 18 tons.

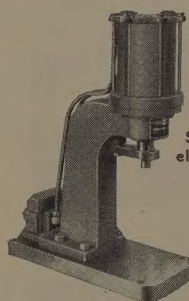
WE RECOMMEND

HANNIFIN AIR PRESSES

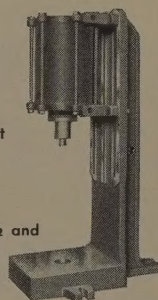
For Production Operations involving assembly, marking, stamping, riveting or punching of small parts. Hannifin ½ and 1-ton air presses are fast, safe and economical . . . in both initial cost and operating cost.

For Bigger Pressing Operations where infrequent use would not warrant the purchase of a hydraulic press. Hannifin lever type air presses are low in first cost . . . are efficient, uniform work . . . are far more economical to operate than out-moded manual presses.

Select the press you need from the complete Hannifin line of air presses. All operate off ordinary shop air supply. There are over 30 basic models from which to choose, many for either bench or floor mounting. Capacities range from ½ ton to 18 tons . . . ram strokes up to 15 inches . . . day-length to 46 inches . . . reach to 12 inches.



Hannifin Series M ½ and 1-ton Air Presses. Supplied with or without electric valves for push button operation.



Hannifin Series A ½ and 1-ton Air Presses. Notice these have adjustable gap.

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Please send me Bulletins 250, 251 and 252
on Hannifin Air Presses.

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Position.....

Company.....

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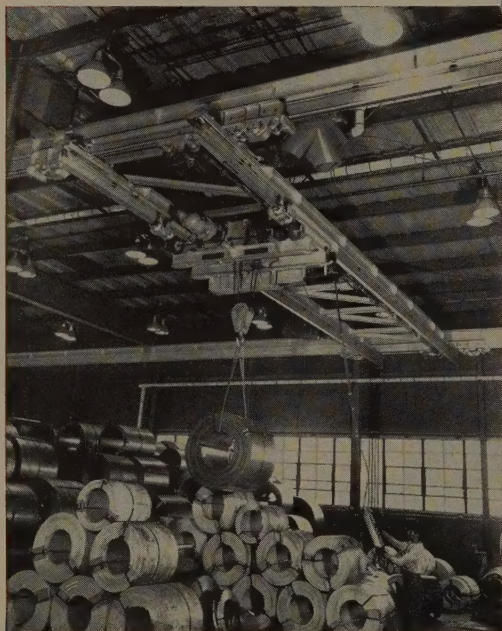
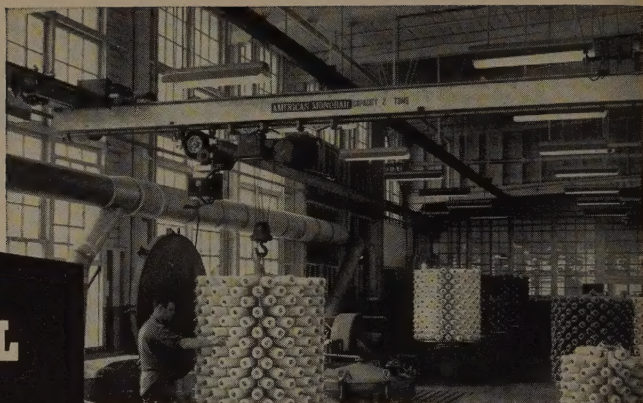
City.....State.....



USE

MONORAIL CRANES

- ... Where Space is Limited
- ... To Handle Variable Jobs
- ... For Low Maintenance Cost



These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and interlocking carrier service between and beyond the craneways. Consultation in connection with any handling problem is available without obligation.

Send for your copy
of C-1 Bulletin



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OVERHEAD
HANDLING
EQUIPMENT

MONORAIL

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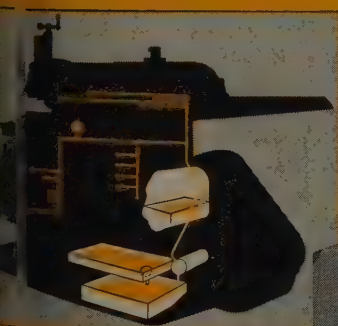
50 lbs. oil pressure

**IS NECESSARY WITH
A CUT LIKE THIS...**

This tremendous cut demonstrates the extra strength, rigidity, and power in Cincinnati Shapers. It also demonstrates the ability of the 50 p.s.i. lubrication system to develop and maintain oil films under the heaviest loads.

Write for Catalog N-5.

Demonstration cut.
Actual size steel chip, 2" cut
.030" feed.



50 p.s.i. system includes 50
mi. filter, settling basin and
reservoir. Transmission runs
submerged in oil.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

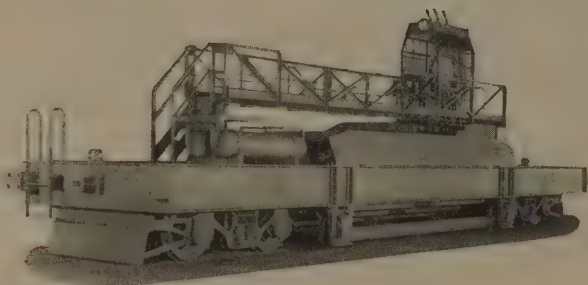
SHAPERS • SHEARS • BRAKES



Time has proved . . .

ATLAS

Builds Dependable Equipment



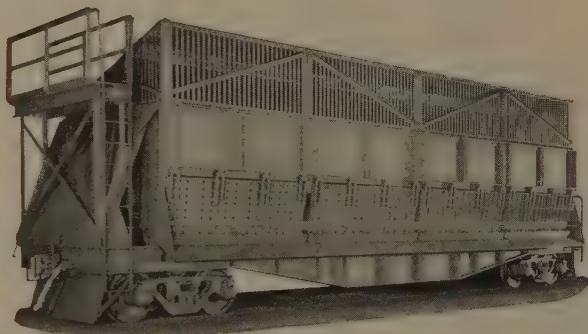
30 Ton Double Hopper Bottom Scale Charging Car. Operator's platform is above hopper to facilitate bin operation.

SCALE CARS



60 Ton Center Bottom Dump Ore Transfer Car. Equipped with pneumatically operated balanced type pusher arm.

ORE TRANSFERS



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LETTERS TO THE EDITORS

Hair Raising Experience



I read with great interest your "shocking story" of the plastic roof of the Ford Skyliner (Mar. 22, p. 5) in the Mirrors of Motordom. I cannot vouch for the plastic seat covers but I do know that service station attendants have mussed up the hair after careful grooming by the simplest expedient of cleaning the roof with a dry cloth. If you have any cub in your mind I would be glad to give a free demonstration the next time you are through Denver. I suspect that the humidity may have something to do with it.

David W. Jon J.
1321 Bannock St.
Denver

Sell, Sell, Sell

We have just seen your article "You Have To Sell" (Feb. 22, p. 11). This is timely, very interesting and well prepared. We could use 25 additional copies.

J. J. Deane
Manhattan Rubber Division
Raybestos-Manhattan
Passaic, N. J.

• Sent.—ED.

That's Our Job

Let me say again what a splendid magazine STEEL is. The editors are doing a magnificent job of editing and furnishing data to its readers.

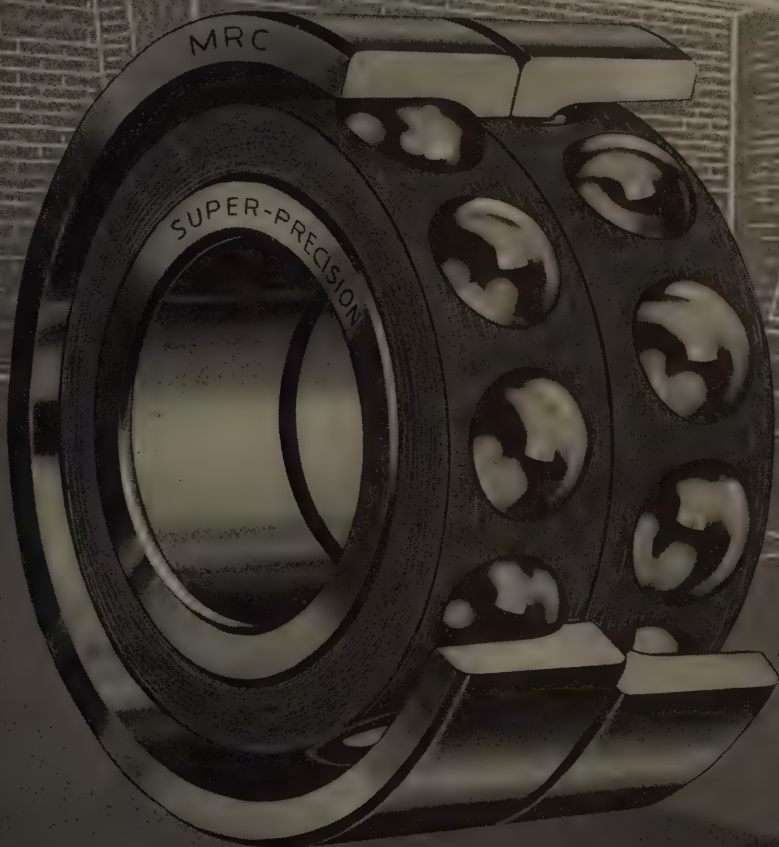
Melvin L. Manwaring
819 South Fifth
Amarillo, Tex.

Featuring Fringe Benefits

The purpose of this letter is to tell you that in my remarks to the foundry industry at the 52nd annual meeting of the Steel Founders' Society of America in Chicago I referred to an article which appeared in STEEL "Bargaining on Economic Downturn" (Mar. 1, p. 51). The article to which I refer dealt with fringe benefits. Well, I know that some foundries are paying close to 45 cents per hour in fringe benefits and others not quite so much. I question whether most companies paying fringe benefits realize the extent to which the payout is not recognized by the worker. In other words, he takes it for granted.

Your article provided much good information, particularly the tabulation

(Please turn to page 12)



M-R-C has long been known for leadership in the field of Super-Precision Ball Bearings. With the opening of our Super-Precision factory in Falconer, N.Y., we are now manufacturing Instrument Bearings of Super-Precision Quality.



Factories:
Jamestown, N.Y.
Falconer, N.Y.
Plainville, Conn.

MARLIN-ROCKWELL CORPORATION, Executive Offices: **Jamestown, N.Y.**



Two 30 ton, 75 ft. span Bedford magnet cranes with 15 ton bucket auxiliaries working over the cinder yard—used as skull crackers in Detroit Steel Company's mill at New Boston (Portsmouth), Ohio.

Bedford Cranes are individually engineered

In steel mills, power plants and throughout heavy industry, wherever superior performance is *expected*, experienced owners are enthusiastically recommending Bedford cranes.

Further proof of the superiority of Bedford cranes is found in the high percentage of *repeat orders* from important owners through the years.

Built to the most modern standards and backed by more than 52 years of specialized crane building and utilization experience... Bedford cranes have won fame the world over for ad-

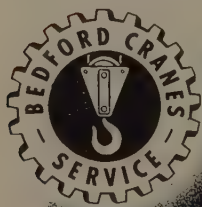
vanced design and for safe, smooth, dependable performance.

Available in all types and sizes... from 5 tons to 350 tons, and up, for all kinds of indoor and outdoor services... each Bedford crane is individually engineered and precision built for its specific application.

You are invited to consult a Bedford engineer on your next crane problem... with all the facts on the table we believe you too will make your next crane a Bedford.



(Write for complete catalog describing Bedford Cranes in detail.)



STEEL MILL CRANES BEDFORD

BEDFORD FOUNDRY & MACHINE COMPANY, INC. • BEDFORD, INDIANA

LETTERS

(Concluded from page 10)

which I suggested as good reading for study and comparisons by every member of the steel foundry industry.

In this office, both **STEEL** and **Foundry** are "must" reading. Keep the good work.

A. J. McNamee
president
Steel Founders' Society of America
Cincinnati, Ohio

Artist Stretches a Graph



Disregarding for a moment all the good points in your Mar. 8 issue, you are in my opinion doing your readers a disservice by printing the type graph used on p. 76. At least I hope you won't again allow a graph to be drawn up with equal abscissal distances representing respectively 8, 5, 1, 8, and 17 years.

W. H. Brumfield
3778 West 10th St.
Cincinnati, Ohio

• We agree.—ED.

Time for Noise Problem

I was very much interested in your article "It's Time To Give Noise Hearing" (Mar. 1, p. 94). We too have a noise problem.

Our operations as fabricators of structural members and tank work involving chipping and grinding which in themselves are real noise makers. However, our problem is: How to keep this out of adjacent offices. These production and engineering offices are located adjacent to the work areas and the offices with large window areas to allow view of shop operations. The sound transmission through these windows is sometimes so high as to make conversation almost impossible. Some experiments have been made with double glass with an air space between the panes to cut down noise, but this has not been too successful.

Do you have any suggestions or other noise problem or can you direct me to any source of information on the subject.

Deo L. Brown
San Jose Steel Company
San Jose, California

• You seem to have two problems. One is the type of noise which can be deadened at its source and the other is how to hold down the noise with the large window area without sacrificing the window. Perhaps some of the noise can be controlled by suspending acoustical baffles from your work area ceilings. You probably would get better results by isolating individual work areas with acoustically-lined cubicles. For further information, write the Acoustical Materials Association, 155 5th St., New York 22.—ED.

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FASTENER STOCK
Available for
IMMEDIATE SHIPMENT
as of APRIL 1, 1954



SPECIALS

PHILLIPS HEAD SCREWS

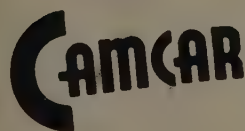
Machine Screws — Sheet Metal Screws
Thread Cutters — SEMS

INDENTED HEX HEAD SCREWS

STANDARDS AND SPECIALS

In steel, brass, and stainless

Check with us on not-listed sizes. They may be in production or completed since this listing.

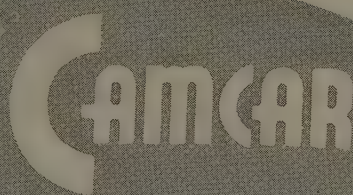


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Rockford, Illinois

Telephone 5-9451

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STOCK TIPS

A request on your letterhead will bring 64-page Standard or 28-page Aircraft Fastener Stock List monthly. Write today!

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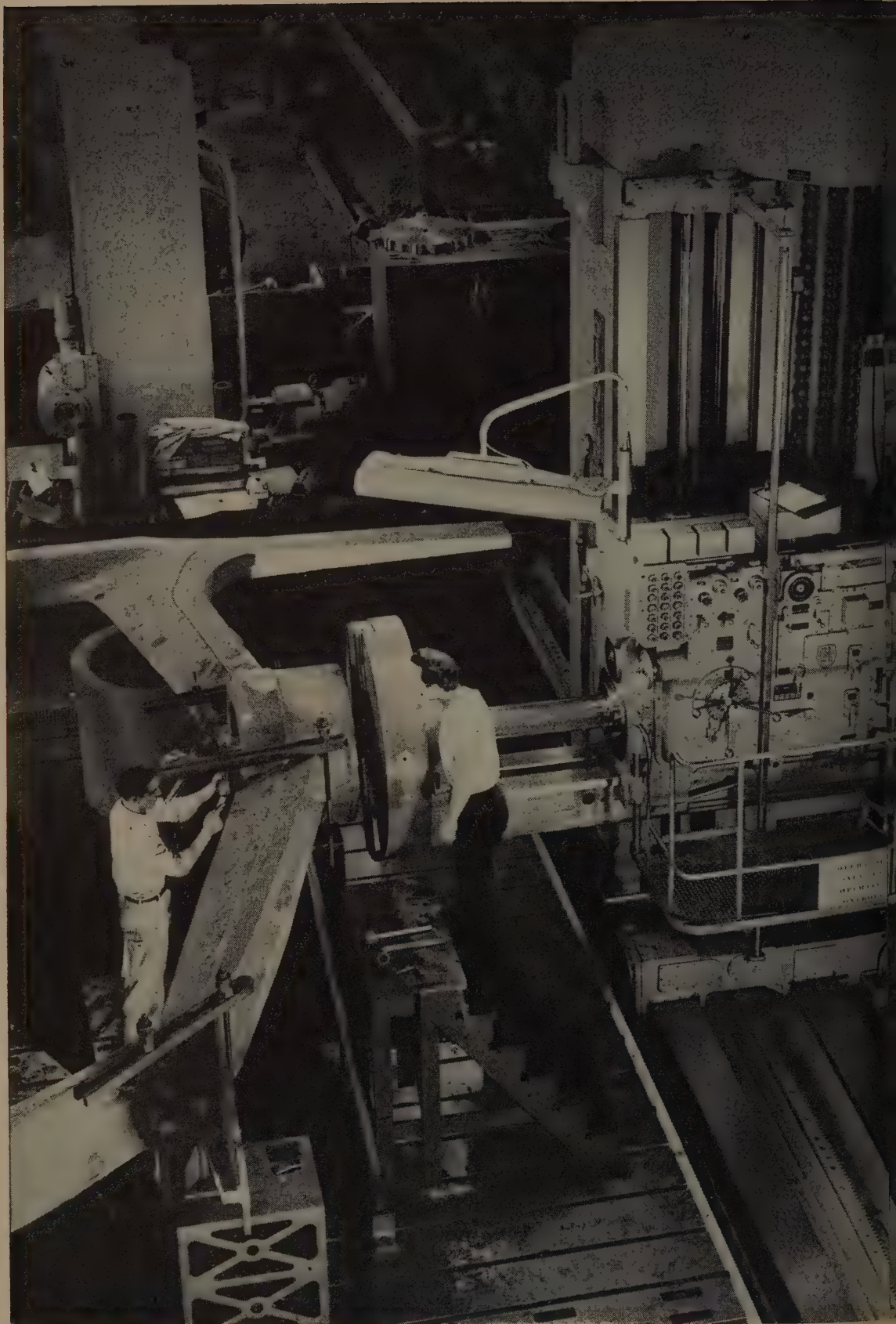


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AN SCREWS

NAS and CT SCREWS

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Machinist's mate... large economy size!

Here's a machine tool that's got everything — versatility, capacity, speed, power and precision. On it, a master machinist can do practically anything. It's a heavy-duty, G & L 50 Series Horizontal Boring, Drilling and Milling Machine

Here's a superb machine that skilled machinists dream of working with. You can bore, drill or mill with equally high efficiency no matter what the workpiece . . . large or small, simple or complex.

Smooth, versatile and powerful . . . it's a machine that performs multiple operations from a single setup. Extremely rigid, with over 100 speeds and an unusually wide range of feeds, a 50 Series machine

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Quality-built to the most exacting standards, G&L 50 Series machines are available in table, floor and planer types . . . with runways, columns and tables to meet any practical requirement. For complete details, see your G&L representative or write for Catalog and Bulletin N-1.



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MACHINE TOOL CO.**

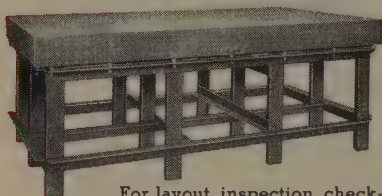
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Photo courtesy of National Supply Co., Torrance, Calif., shows 50 Series Floor type machine boring and facing the stern propeller shaft housing in the skeg casting for an ocean-going freighter.

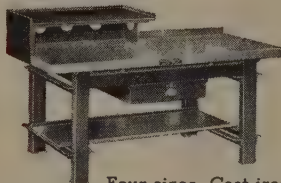
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Four sizes. Cast iron top, two inches thick. Welded steel supports, tool box shelf, steel drawer with lock.



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for
savings in
packaging and
shipping

ACME STEEL IDEAS

for materials handling ideas and problem-solving ask Acme Steel first

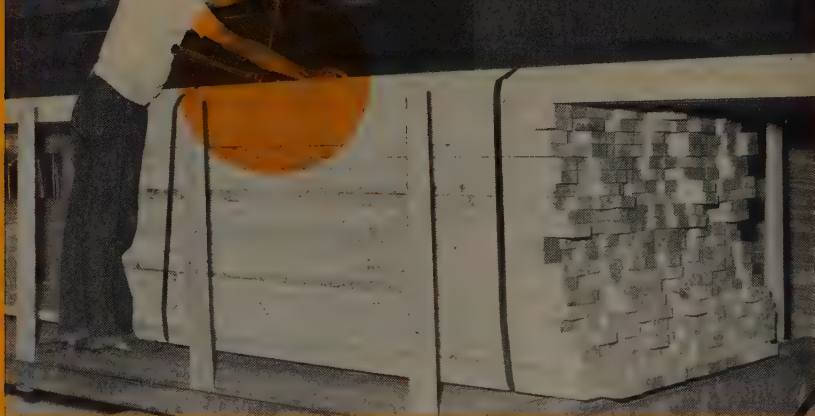
Whether you sell or buy, you must pay for packaging and for shipping. Helping control these costs and at the same time, making sure your merchandise is packaged to arrive damage-free, is the *aim* of Acme Steel Company.

Acme Steel Strapping and Wire Stitching methods are engineered to your specific operations . . . set up by Acme Steel representatives to save costs in time, labor and materials. Ask your Acme Idea Man about steel strapping and wire stitching ideas that will uncover extra profits in your business.

*ask your
Acme
Idea
Man
to help solve
your problems

ACME STEEL
CHICAGO

**ACME
STEEL**



Idea #401—Home Materials Company, Mansfield, Ohio, is saving time and labor costs by bundling lumber at the yard prior to delivery. Lumber arrives undamaged and is easily inventoried when Acme Steel Unit-Load Band is used.

AIM

➤ for safe, lower-cost shipping with Acme Steel Strapping and Wire Stitching ideas



Idea #403—Acme Steel Silverstitchers and Stitching Wire have played a part in a 20% increase in packaging output and a 50% reduction in manpower at Burroughs Corporation of Detroit. Also, the company is certain its products arrive undamaged.

Idea #404—Richmond Export Services in California maintains a packaging pace that adds to profits. Time, labor and material costs were reduced in assembly of flat cartons through the use of Acme Steel Wire Stitching Machines.



Idea #402—The fast handling and safe shipping of bulky rolls of tire cord fabric has been solved at Firestone Textiles, Gastonia, N. C. This Acme Steel Strapping Idea permits ten to twelve 1300-pound rolls to be packaged an hour.



Idea #406—Plastic Process Co. Inc., Los Angeles, has saved 82% in packaging materials and 50% in time and labor costs by using Acme Steel Strapping. Packaging of 400-foot coils of pipe is no longer a major shipping headache.



Idea #405—Damage claims have been eliminated as a result of using Acme Steel Unit-Load Band at Jos. A. Likely, Ltd., St. John, New Brunswick. Today, the loading of reinforced concrete pipe has been speeded up and there is a full assurance of safe arrival.



Idea #408—Orangeburg Manufacturing Co., New York, has saved packaging and handling costs of pipe with modern Acme Steel Strapping methods. Packaging productivity was increased; handling costs at the site of installation reduced.

Idea #407—Acme Steel Strapping methods have answered a loading problem at The Gardner Board and Carton Co., Middletown, O. The "controlled floating-load" method cuts freight bills and bracing costs . . . makes loading quick, easy.

ask your **Acme Idea Man**
to apply these ideas to your
shipping problems . . .

- Idea #101**—Skid loading empty battery boxes
- Idea #102**—Ring for looping strapping around large containers on conveyor lines
- Idea #103**—Strapping bundles of nested bakery pans
- Idea #104**—Palletizing and carloading wax slabs
- Idea #105**—Palletizing and carload bracing multi-packs of television tubes
- Idea #106**—Strapping coils of tire camelback
- Idea #107**—Carload bracing coiled copper rod
- Idea #108**—Skid loading cellophane rolls in cartons
- Idea #109**—Bundling and truck loading bee hives
- Idea #110**—Strapping reclaimed rubber onto skids, into palletless units, and carloads
- Idea #111**—Bundling solid fibre newsprint cores
- Idea #112**—Strapping foundry flasks into bundles
- Idea #113**—Strapping dies for paperboard cartons
- Idea #114**—Bundling a glazed combination door
- Idea #115**—Bundling glazed storm windows
- Idea #116**—Bundling glazed check-rail windows
- Idea #117**—Bundling glazed plain sash rail windows
- Idea #118**—Unitizing and skid loading Kd cartons
- Idea #119**—Bundling empty tin cans cuts damage
- Idea #120**—Skid loading empty 155 millimeter shells
- Idea #121**—Reinforcement of dry sand core molds
- Idea #122**—Carload bracing of empty cable reels
- Idea #123**—Self-palletized unit of concrete block
- Idea #124**—Strapping regular slotted containers with end flaps folded last
- Idea #125**—Reinforcement of crates for five-gallon water bottles
- Idea #126**—End stack bracing for carload shipments of case goods
- Idea #127**—Carloading mixed shipments of kegs and cases of beer
- Idea #128**—Reinforcement of wood pallets
- Idea #129**—Skid loading printed material
- Idea #130**—Bundling mounted tires for export
- Idea #131**—Bundling refractory brick for palletless shipment
- Idea #132**—Bailing scrap paper
- Idea #133**—Tying protective wrappings to oxygen cylinders.

the **Acme Idea Man**

—backed by years of experience
and Acme Steel packaging specialists—
is your source for complete data
on modern shipping methods.

Ask your
Acme Idea Man
to help solve
your problems



The materials handling and shipping methods that are often most economical and that assure safest arrival are those which are planned at every step of manufacturing—from product design through to product delivery. This is the *aim* of your Acme Idea Man. And he is trained to analyze any or all of your shipping or packaging problems . . . make an on-the-job demonstration . . . and give you specific recommendations.

Acme Steel Company experience in problem-solving reaches into every conceivable use of steel strapping and stitching wire. This knowledge, coupled with modern Acme Steel Strapping Tools and Wire Stitching Machines, is available through the nearest Acme Idea Man. Now is the time to put him to work for you. Call him, or mail the coupon below to Acme Steel Products Division, Acme Steel Company.

ACME STEEL PRODUCTS DIVISION, Dept. GH-44

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2840 Archer Avenue, Chicago 8, Illinois

Please send me further information on Acme Steel's Safe, Lower-Cost Shipping Methods. I am interested in ☐ Steel Strapping; ☐ Wire Stitching; ☐ having an **Acme Idea Man** call on me.

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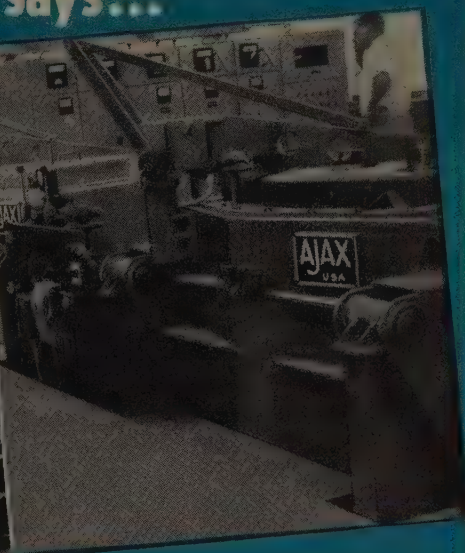
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STEEL**

Mt. Vernon Die Casting Corp., says...

*'We highly
Recommend'...*

AJAX

TAMA-WYATT
Induction Furnaces -



Two views of AJAX Furnaces installed at the new Stamford, Conn. plant of Mt. Vernon Die Casting Corp. Photo at left shows two 166 kW furnaces in foreground for melting aluminum, and in background two 60 kW and five 20 kW furnaces for melting zinc. The zinc die casting machines are shown in right rear.

Upper photo shows another view of the 166 kW furnaces, with control cabinets in the background.

After a most satisfactory experience of more than five years with AJAX low frequency Induction Furnaces in their Mt. Vernon, New York plant, this company has now installed the furnaces shown above in their new modern plant at Stamford, Conn. "We are convinced," they state, "that economy of operation makes this type of furnace well worth while. We intend to continue to install them till all our die casting machines are fed by AJAX furnaces."

AJAX induction melting and holding furnaces are gaining wide acceptance in the American die casting industry. Experience has shown that they greatly improve the overall performance. In particular, the absence of fumes and reduction of radiant heat give greater comfort to the operators. Electricity is one of the few commodities which have not increased in price in recent years.

Agitation, due to internal electrical stirring, insures

uniform temperature and homogeneous mixing of the ingredients. Since linings are made of inert refractories, they cannot contaminate the melt. Temperature control is entirely automatic and keeps the molten mass within $\pm 5^\circ \text{F.}$, holding the metal at the lowest feasible casting temperature.

Amazingly low maintenance is the rule. Some furnaces operate for as long as 7 years without renewal of refractory lining. Rejects and metal losses are extremely low.

AJAX

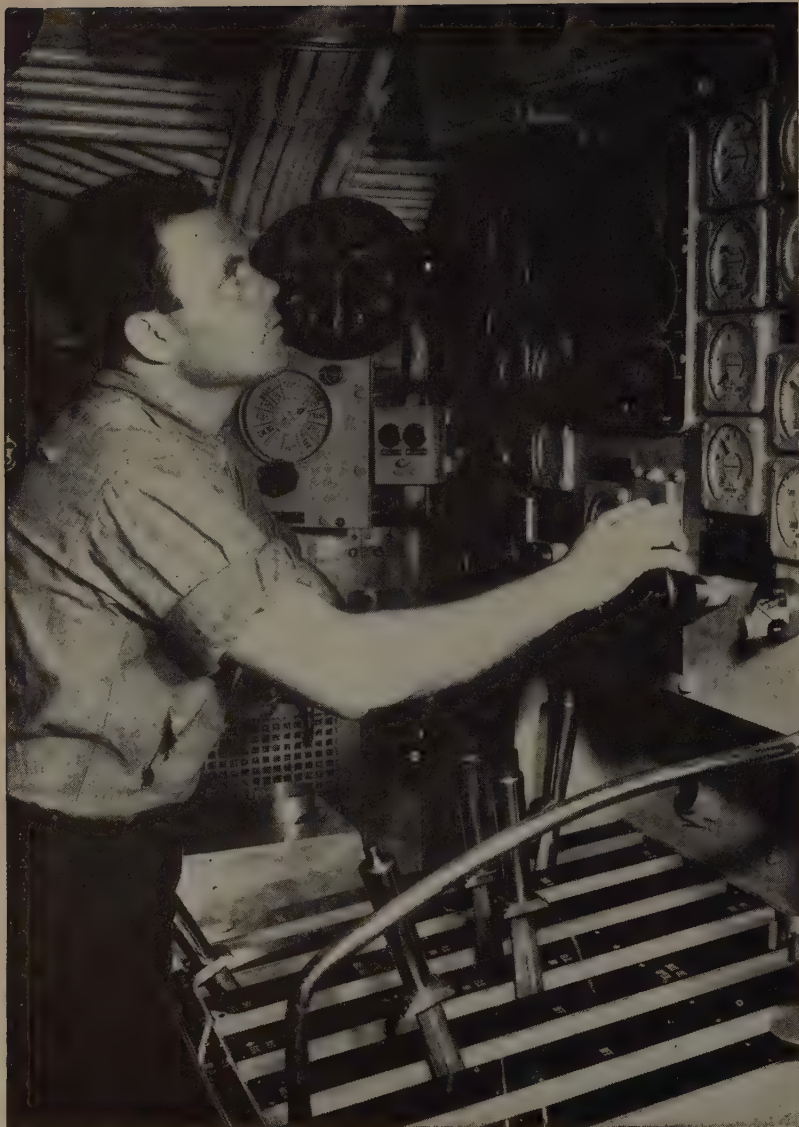
TAMA-WYATT



AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hullgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting



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Meters
tell the tale
but
**SPECIAL
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do the
work

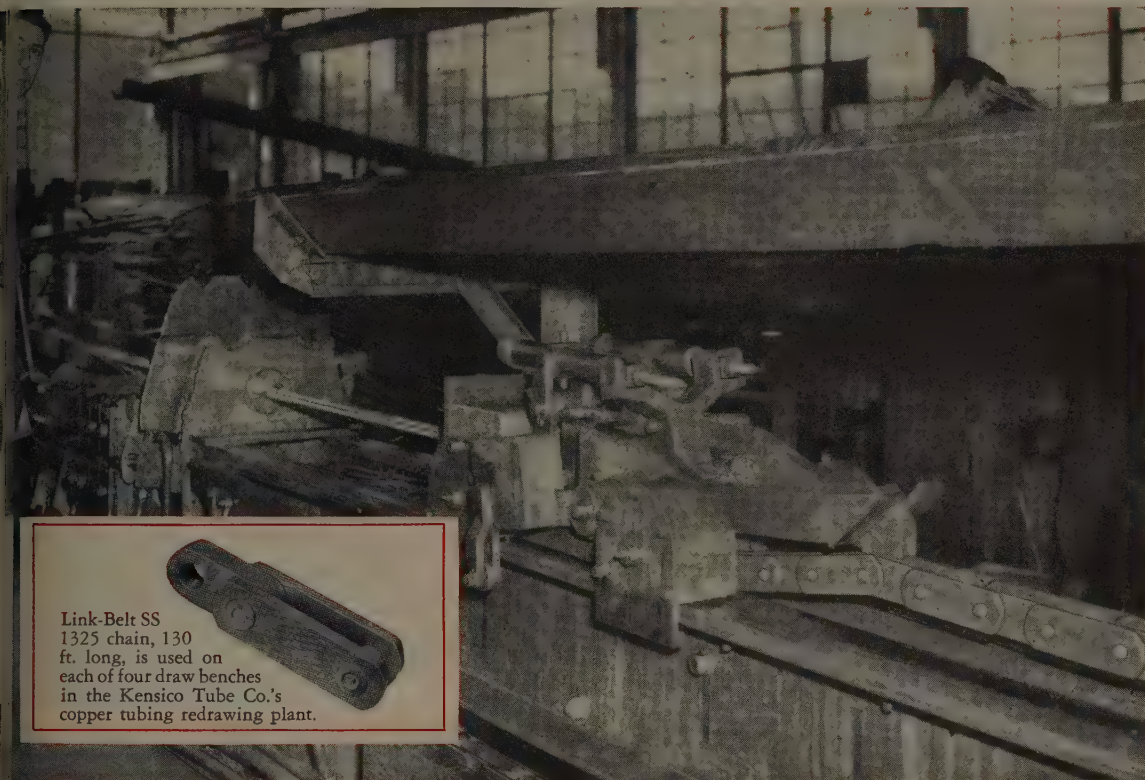
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PIONEER in Specialloy Steels
Allegheny Ludlum

Warehouse stocks of Allegheny Stainless carried by all Ryerson plants



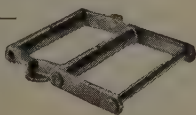
Here's why so many of the nation's draw benches use **LINK-BELT** chain



Link-Belt SS 1325 chain, 130 ft. long, is used on each of four draw benches in the Kensico Tube Co.'s copper tubing redrawing plant.

No ONE chain serves every purpose
—get the RIGHT one
from the complete line

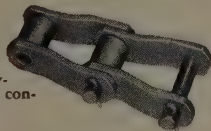
Class H drag chain—
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handling shavings
or other refuse in
runways or troughs.



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tion chain—pop-
ular, durable,
low cost design for
elevators, conveyors.



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suitable for heavy-
duty drive and con-
veying jobs.



Transfer chain with
tilting dogs — for
plate and slab travel,
loads up to 300,000 pounds.



LINK-BELT offers the chain that's best for every job

WHETHER it's for a 5000 or a 100,000-pound bench, Link-Belt draw bench chain is built to maintain close pitch and correct sprocket contact. Links are accurately machined after hardening by a special process that assures longer chain life.

Manufacturing refinements such as these are typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity.

For complete information on chains and sprockets for draw bench or any drive or conveyor service, see your Link-Belt sales representative. He can show you the *one* chain that's best for your requirements.

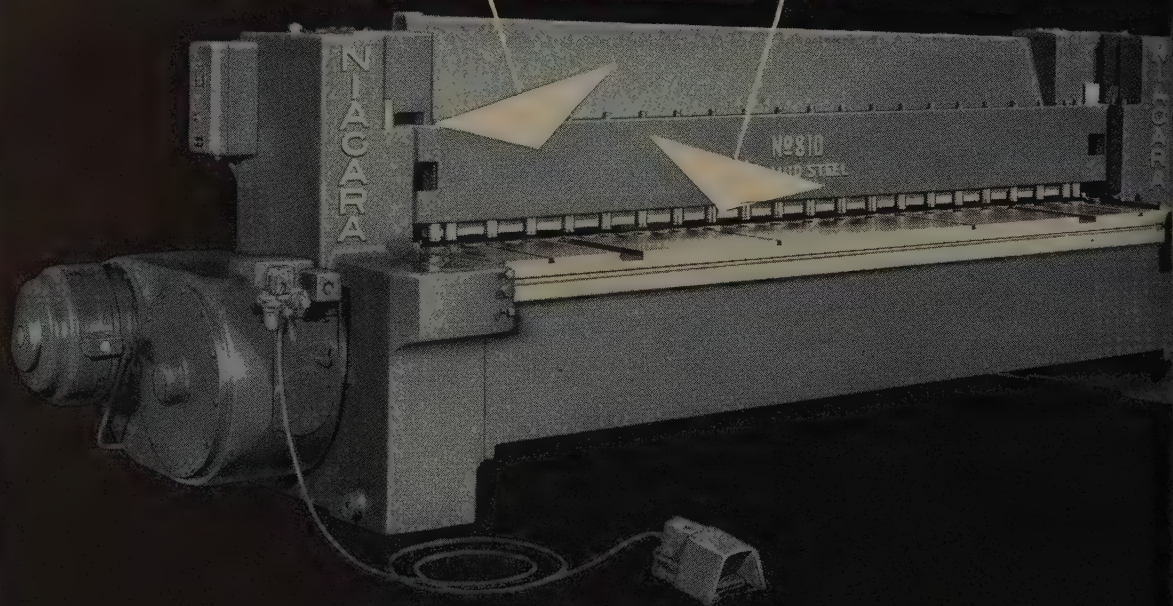
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Positive, power actuation grips work securely for maximum cutting accuracy.

LOW IMPACT AVERTS DAMAGE AND INACCURACY

Individual pressure feet contact work with low impact, thus safeguarding both the material and bed against damage, as well as reducing noise level. No hammer-blow to mar work. No peening of bed with resulting distortion of knife seat.

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Individual feet are self-compensating, requiring no adjustment for cutting stock of different thicknesses . . . even at the same time.

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In a power squaring shear, no single feature nor component can be fully responsible for accuracy, speed and economy. They result from a combination of features such as the self-compensating holddown; rigid, fully closed box section construction of bed and crosshead; low slope of upper knife; ample and accurately held crosshead guides; multiple point sleeve clutch—the very features that have established the marked superiority of Niagara's Underdrive Series.

For the whole story, straightforwardly presented, on America's most complete line of underdrive power squaring shears, with capacities from shim stock to 1 in. thick mild steel (lengths 3 to 20 ft.), request *Niagara Bulletin* 69. Write today.



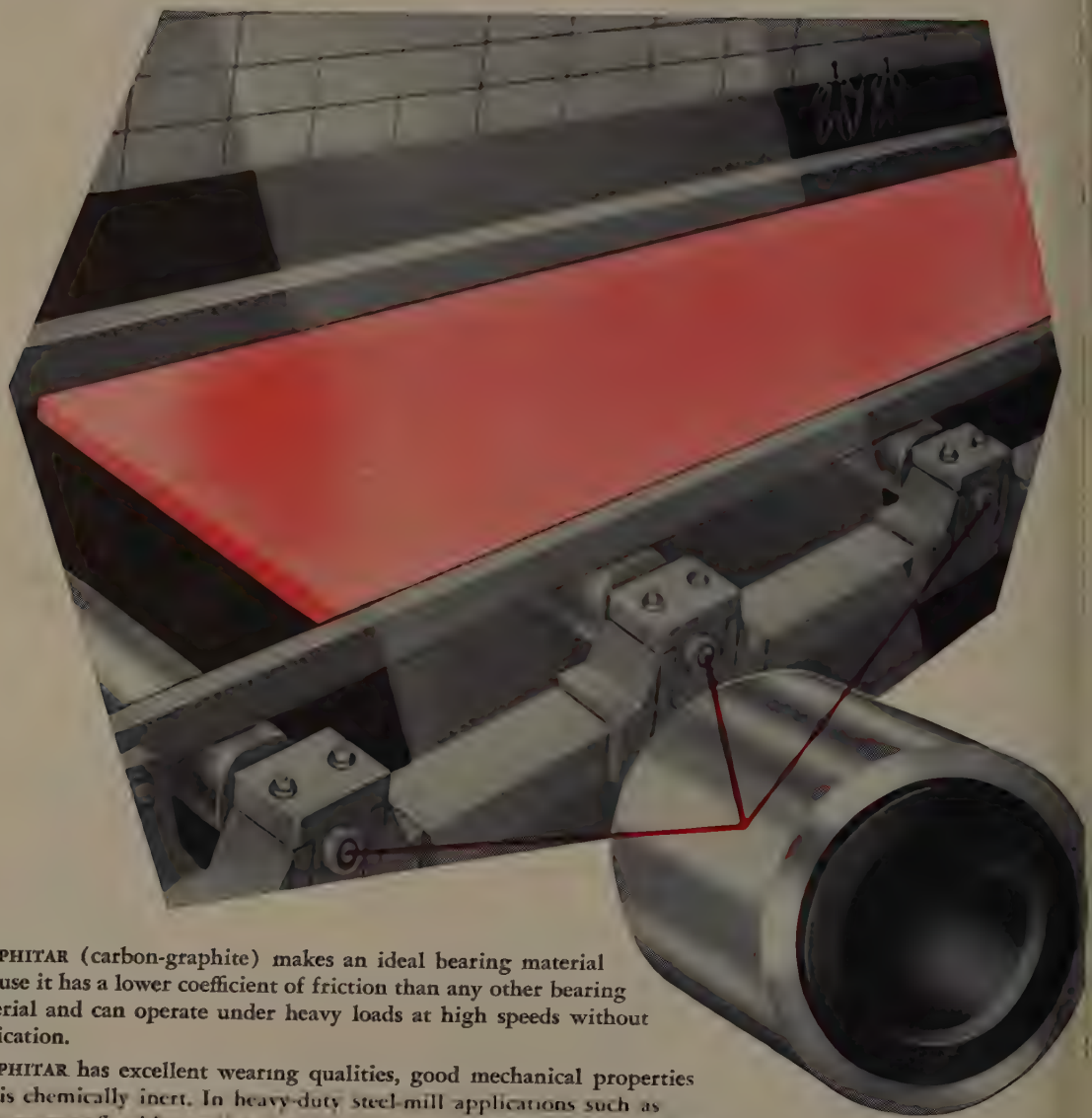
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Metal-backed GRAPHITAR bearings provide exceptional strength and durability for long life in difficult steel mill applications



GRAPHITAR (carbon-graphite) makes an ideal bearing material because it has a lower coefficient of friction than any other bearing material and can operate under heavy loads at high speeds without lubrication.

GRAPHITAR has excellent wearing qualities, good mechanical properties and is chemically inert. In heavy-duty steel-mill applications such as shear or cut-off tables, coil and slab conveyors, the GRAPHITAR bearings are metal-backed to provide additional strength and resistance to shock. GRAPHITAR metal-backed bearings can be supplied in tolerances as close as .0005" ready for installation.

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OUR 100th YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

CALENDAR

OF MEETINGS

April 12, Society of Automotive Engineers: Annual aeronautic production forum, Hotel Statler, New York. Society address: 29 W. 49th St., New York 18. Secretary and general manager: John A. C. Warner.

April 12-14, American Gas Association: Sales conference on industrial and commercial gas, Edgewater Beach hotel, Chicago 40. Association address: 420 Lexington Ave., New York 17. Secretary: Kurwin R. Boyes.

April 13, Material Handling Institute Inc.: Spring meeting, Drake hotel, Chicago. Institute address: 813 Clark Bldg., Pittsburgh 22. Secretary: N. F. Young.

April 13-14, American Institute of Steel Construction: Annual national engineering conference, Hotel Schroeder, Milwaukee, Wis. Institute address: 101 Park Ave., New York 17, N. Y. Secretary: M. Harvey Smedley.

April 13-14, Industrial Truck Association: Spring meeting, Drake hotel, Chicago. Association address: Washington Loan & Trust Bldg., Washington 4. Secretary: William Van C. Brandt.

April 14-16, Society for Experimental Stress Analysis: Spring meeting and exhibit, Hotel Netherland Plaza, Cincinnati. Society address: P.O. Box 168, Cambridge 39, Mass. Secretary: W. M. Murray.

April 18-23, American Ceramic Society Inc.: Annual meeting, Palmer House, Chicago. Society address: 2523 N. High St., Columbus 2, O. Secretary: Charles S. Pearce.

April 20, Conference on Instrumentation in Water, Sewage and Industrial Waste Treatment, Manhattan College, sponsor, Information: Civil Engineering Dept., Manhattan College, New York 71.

April 20-21, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

April 21-23, American Institute of Electrical Engineers: Annual conference on feedback control systems, Hotel Claridge, Atlantic City, N. J. Information: G. L. Stancil Jr., Vickers, Inc., 723 - 15th St., NW, Washington.

April 21-23, National Screw Machine Products Association: Annual meeting, Hotel Statler, Detroit. Association address: 2860 E. 130th St., Cleveland 20. Executive secretary: Orrin B. Werntz.

April 22-23, The Wire Association: Annual regional meeting, Hotel Sheraton, Worcester, Mass. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 22-24, American Society for Metals: Annual lower lakes regional conference, Hotel Seneca, Rochester, New York. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

April 23-24, National Association of Cost Accountants: Richmond regional conference, Hotel John Marshall, Richmond, Va. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

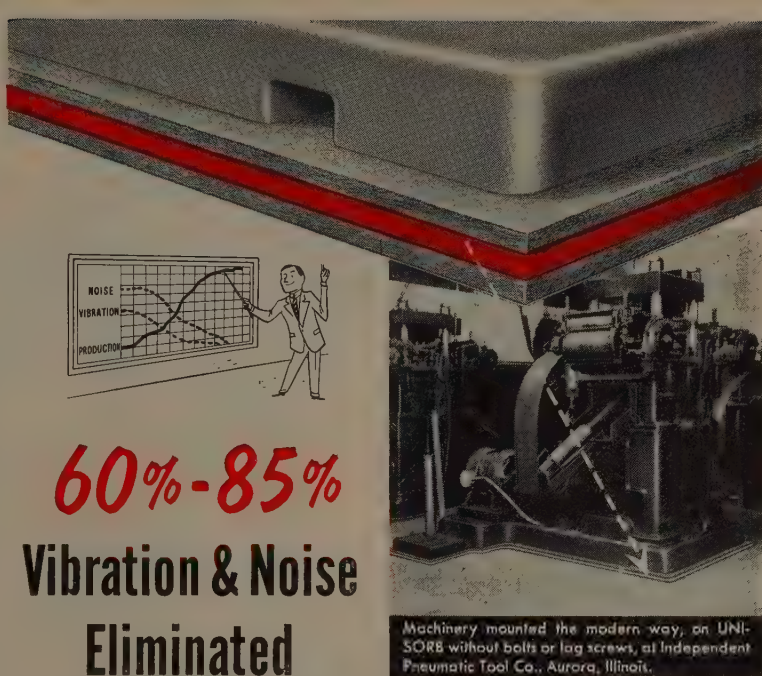
April 26-28, American Management Association: Manufacturing conference, Hotel Statler, Cleveland. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

April 26-28, Metal Powder Association: Annual open meeting and exhibit, Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 26-30, American Society of Tool Engineers: Convention and industrial exposition, Convention Center, Philadelphia. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: H. E. Conrad.

April 26-30, Industrial Health Conference, Hotel Sherman, Chicago. Information: Publicity Committee, 1954 Industrial Health Conference, 205 N. La Salle St., Chicago 1, Ill.

April 28-May 1, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting, The Homestead, Hot Springs, Va. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15.



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When you mount machinery on...

UNISORB®

By eliminating transmitted machine vibration to a proven extent of 60 to 85%, UNISORB mounting prolongs building and floor life as well as the life of your machinery.

By considerably reducing the noise factor, UNISORB boosts worker morale and efficiency.

What's more, UNISORB requires no bolts or lag screws, makes old-fashioned floor drilling obsolete. A strong cement firmly bonds the UNISORB pads to machine feet and floor, with a holding strength of at least 90 lbs. per square inch.

Return the coupon today for complete information about modern machinery mounting.

UNISORB is also available pre-coated with adhesive, but is not recommended for use with machines that require shimming.

You Reduce
VIBRATION
NOISE
MAINTENANCE

with **UNISORB** Mountings

- no bolts, no lag screws, no holes to be drilled, no floor damage
- Felters adhesive holds for keeps, yet permits re-positioning of machines. (Our UNISORB Booklet tells you how.)

THE FELTERS COMPANY

231 SOUTH STREET, BOSTON 11, MASS.

Offices: New York, Philadelphia, Chicago, Detroit, St. Louis

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MAIL COUPON FOR FREE BOOKLET TODAY!

NAME..... TITLE.....

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COMPANY.....

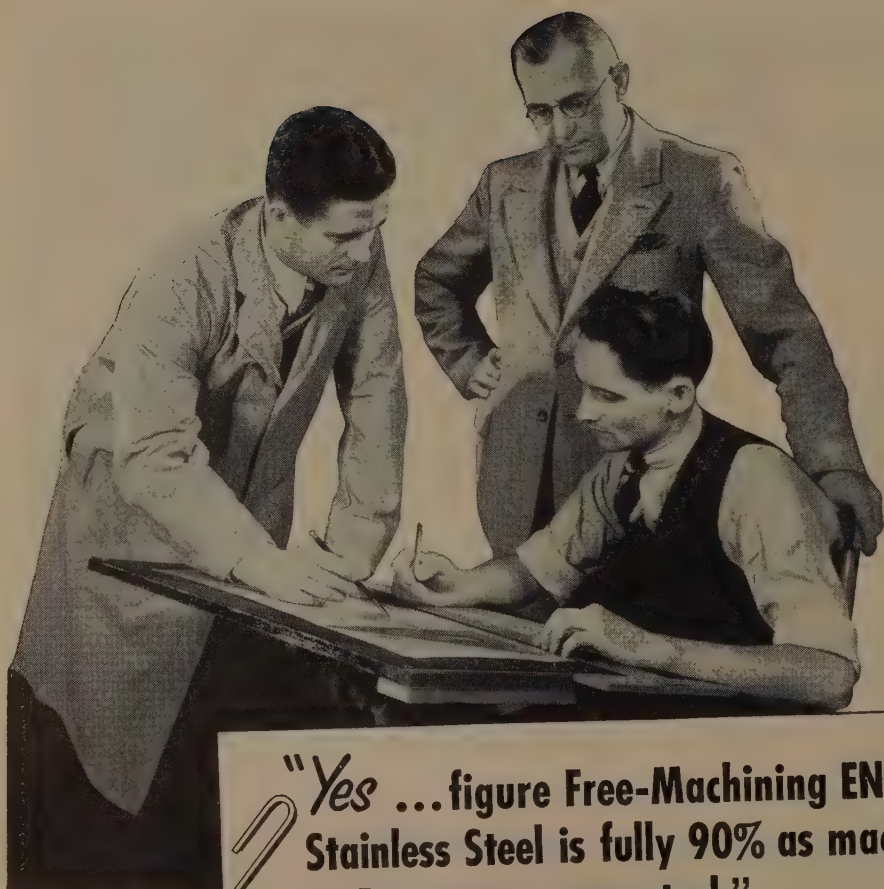
STREET.....

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LOOK FOR THE RED CENTER



Please send my free copy of the booklet containing the complete story of UNISORB Mounting.



**"Yes ... figure Free-Machining ENDURO
Stainless Steel is fully 90% as machinable
as Bessemer screw stock"**

You can give duplicate steel parts added strength and increased heat- and corrosion-resistance . . . and still get economical automatic production.

Simply convert to free-machining ENDURO Stainless Steel Bars. They're cold-finished by Republic's Union Drawn Steel Division to give you close tolerance, accuracy of section, uniform soundness, and fine surface finish . . . plus the high physical and chemical properties of stainless steel. Two grades are

fully 90% as machinable as regular Bessemer screw stock.

Free-Machining ENDURO also is available in hot-rolled bars and in wire. Republic metallurgists give prompt, obligation-free assistance on applications, processing and use.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC ENDURO

FREE MACHINING STAINLESS STEEL



Other Republic Products include Carbon and Alloy Steels — Titanium — Pipe, Sheets, Strip, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

How fast CAN YOU PRE-HEAT AN 8" DIA. BRASS OR COPPER BILLET TO 1600°F.?

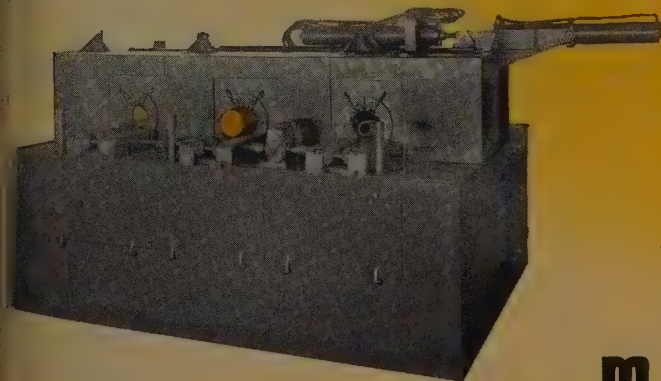


COMPARE WITH WHAT IS BEING DONE WITH A MAGNETHERMIC LOW-FREQUENCY (60-CYCLE) INDUCTION HEATER

● The Magnethermic pre-heats an 8" dia. or brass billet every minute. Unusual? No. This speed is why the copper and brass industry is taking a serious look at low-frequency (60-cycle) induction heating. In addition to speed, the heater offers other operating advantages. Individual temperature control of each billet assures uniform heating of each billet. No chance of cold or over-heats.

Magnethermic does not require warm-up time, eliminating pre-heating billets far in advance. Space (8' x 10' average), is many square feet less than conventional heating equipment. Maintenance — nothing to maintain but the heating coils. These require infrequent attention.

Magnethermic pioneered low-frequency (60-cycle) induction heating. You can obtain complete information by writing, telephoning or wiring your inquiry or request to Magnethermic. We will reply.



3-coil Magnethermic brass billet heater rated at 8,000 pounds per hour.



MAGNETHERMIC
corporation

3990 SIMON ROAD

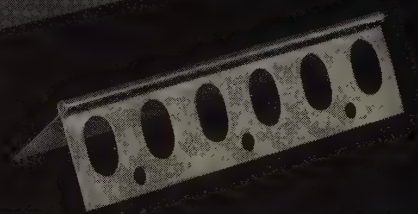
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WHEELING'S

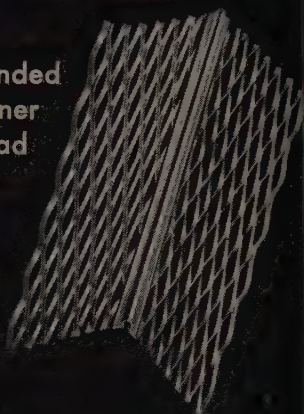


Conductor
Pipe



Flat Apron
Corner Bead

Expanded
Corner
Bead



NEW



Coal Hod Bottom



Style K
End Cap

Oil Can
Spout



sofTITE

TRADE MARK

**GALVANIZED SHEETS
PERMIT ALL THIS (AND MORE)
WITH NO CHIPPING OR
FLAKING OF COATING!**

● The reason for the remarkable workability of Wheeling SofTite is that it is ductile and tight coated to a most amazing degree. As a result, it forms freely and easily, with no strains in the zinc coating, no chipping or flaking of coating.

This versatile combination of a soft, ductile steel base and an incomparably tight zinc coating represents a signal achievement in sheet steel metallurgy. For not only is it manufactured by a new and

revolutionary process* perfected by Wheeling engineers, but it also achieves the long-sought qualities and characteristics unobtainable in the past.

Users of Wheeling SofTite Galvanized Sheets have acclaimed them the ultimate in continuously coated galvanized sheets.

Working sample available. Call or write nearest warehouse or office. Wheeling Steel Corporation, Wheeling, West Virginia.

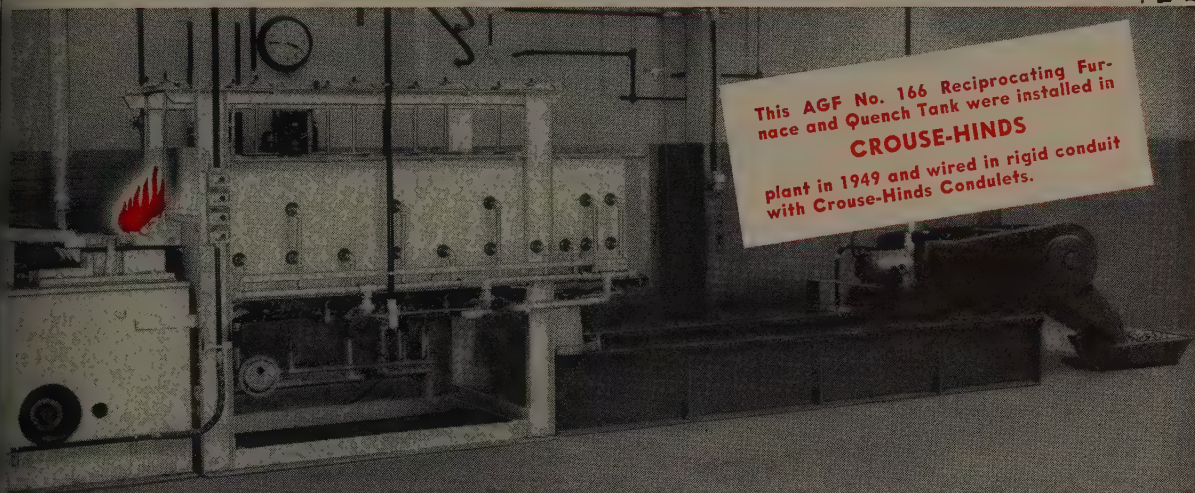
*Covered by U.S. Patent No. 2,647,127

IT'S WHEELING STEEL!



'Improves working conditions'

says A PROMINENT INDUSTRIAL ENGINEER



AFG is the PIONEER manufacturer of Pot Furnaces for salt bath hardening, but recognizes that **AUTOMATIC RECIPROCATING FURNACES** improve working conditions in 9 out of 10 applications.

Read This Engineer's comment—

"They call this a reciprocating controlled atmosphere furnace with quench tank and conveyor, used for carburizing and quenching clips and various other parts requiring certain hardness characteristics with high yield point, without embrittlement. The furnace is controlled within plus or minus $2\frac{1}{2}^{\circ}$ and has been in steady use since November 1949.

"As a comparison, the operation was formerly done by heating in a salt bath in which both quantity and quality were unsatisfactory, requiring the services of an operator working under hard and undesirable conditions.

"The present operation, being fully automatic except for occasionally dumping fresh parts into the feed chute and removing a full box from the quench conveyor, gives us a product of the desired quality and quantity."

Advantages of— A G F RECIPROCATING FURNACES

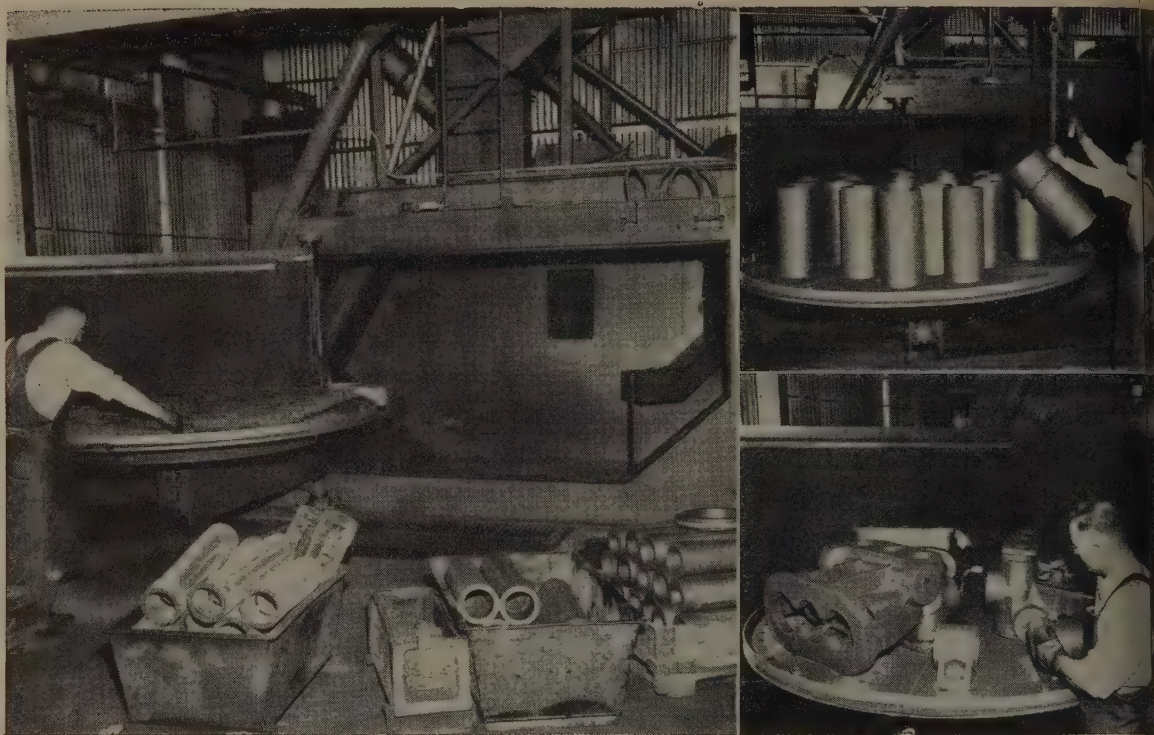
- Provide better working conditions
- Nothing to do but charge
- Any desired atmosphere by simple control
- High production heat treating
- Hardening and quenching—one continuous automatic operation
- Dependably uniform hardening
- No messy salt to clean
- No pots to replace
- Clean hardening results
- No dangerous sputtering or splattering
- Fully sealed muffle
- Low cost of operation
- No messy salt to replace



AMERICAN GAS FURNACE CO.

996 LAFAYETTE STREET

ELIZABETH 4, NEW JERSEY



Wheelabrator Saves in Mass Cleaning of Multiple Products

One Machine Cleans Castings, Mill Steels, Heat Treated Work and Used Parts

Firms making many different sizes and types of metal products with a relatively small volume of each can profit from the experience of the Halliburton Oil Well Cementing Co., Duncan, Oklahoma. Faced with an expanding production of an increasing number of parts, they discovered that the shop-built blasting room was unable to keep pace with cleaning requirements.

The answer to their problems was the installation of an airless Wheel-

abrator Swing Table. Its operation has proved highly successful in cleaning work of the following types:

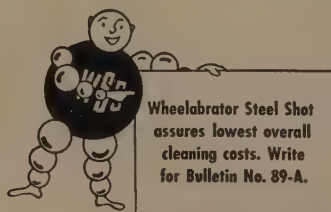
1. Heat treated partially machined parts.
2. Rough castings before machining.
3. Mill steels before machining, painting and plating.
4. Used parts to be repaired.

Wheelabrating has cut labor requirements in half. Only one operator is required part time to clean

their entire production instead of the 2 men previously needed. Cleaning quality has materially improved with the elimination of the human factor in hand blasting.

Multiple loading and mass cleaning of this variety of parts has effected a considerable savings in cleaning costs. During the first 4 months of 1953 Halliburton cleaned a total of 633 tons of metal pieces. Of this total, 151 tons consisted of pieces weighing up to 50 lbs. each with an estimated cleaning cost of $\frac{1}{2}$ c per pound. The balance included parts weighing from 51 to 1250 lbs. each and was cleaned for $\frac{1}{4}$ c a pound.

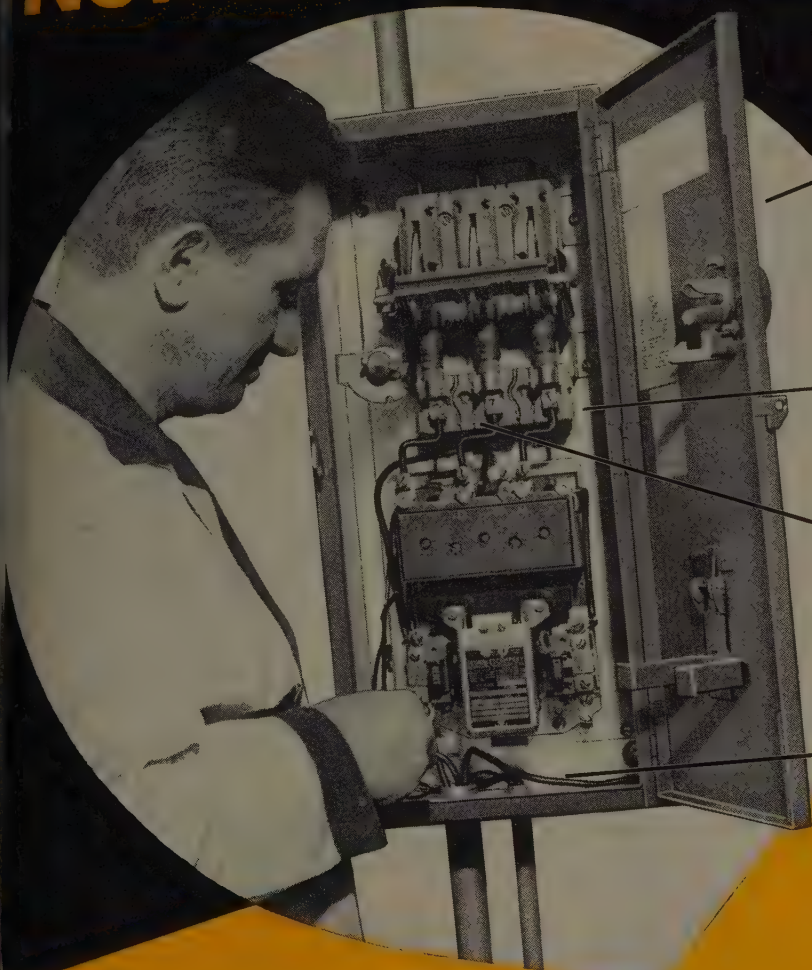
For complete details on Wheelabrator cleaning, send for Bulletin 74-B.



American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.

Wheelabrator®
AIRLESS BLAST
CLEANING

EASIER TO INSTALL AND MAINTAIN!



mount 1 device
instead of 2

extra-wide
gutters

all
components
accessible
from front

plenty of
knockouts

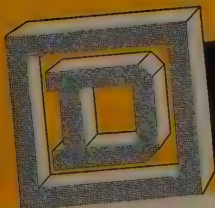
SQUARE D COMBINATION STARTERS

(Switch or Circuit Breaker Types)

Save space and time. Mount and wire
one device instead of two . . .
neater, more attractive installations.

Write for Bulletins 8538 and 8539
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ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS



SQUARE D COMPANY

Rugged packaging



—helps make

USS Amerstrip

America's **preferred** strip steel

Every shipment of USS Amerstrip gets to you quickly, and *intact*. Amerstrip is tightly bound to a sturdy wooden pallet with steel bands. It travels the roughest roads, the fastest freights, without damage. Assurance that Amerstrip will arrive in good condition, ready to use, is one reason why it is more widely used in a greater variety of products than any other strip steel.

Amerstrip comes in a complete range of analy-

ses and tempers in carbon, stainless, and alloy steels . . . in coils or cut lengths . . . with a round or square, natural or rolled edge . . . in *all* commercial finishes.

If you have any question about the selection or use of strip steel, write to American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio. Our steel specialists will be glad to help you.

Amerstrip

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STAINLESS

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TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

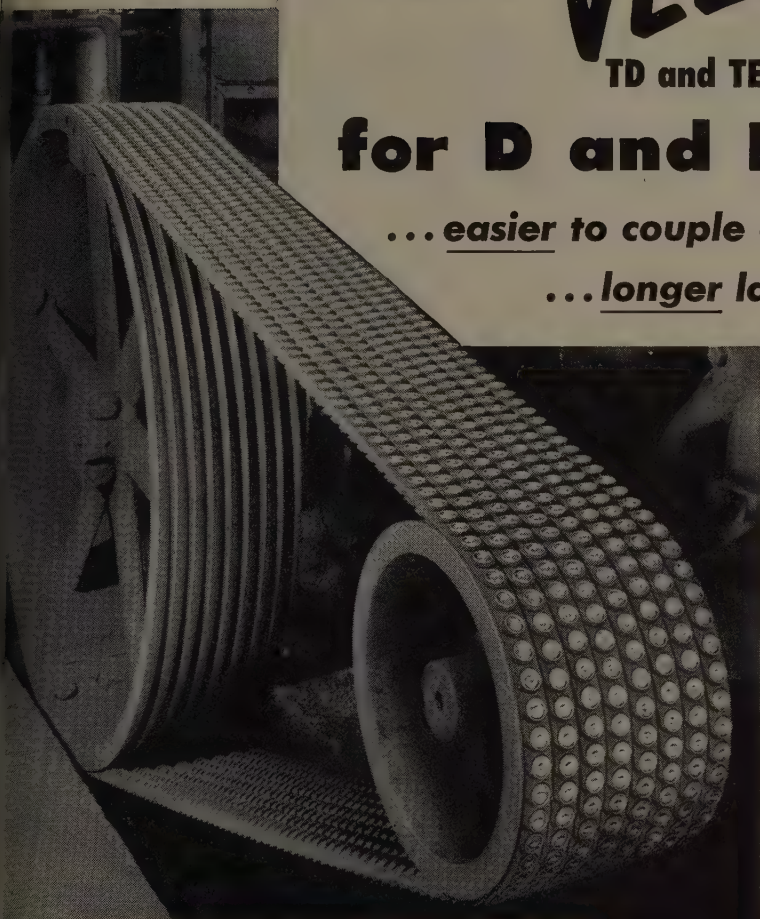
NEW VEELOS

TD and TE Adjustable V-belts

for D and E Drives

... easier to couple and uncouple

... longer lasting

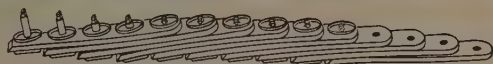


Now get the v-belt that's been especially developed for D and E drives—the new, patented Veelos TD and TE adjustable v-belt!

This new Veelos has advantages unmatched by any other v-belt. It is *installed quickly* without removing the outboard bearings found on most D and E drives. It is the easiest v-belt to couple and uncouple ever developed. Cup-washers and T-screws join links together to form individual belts of any length. Veelos TD and TE *lasts longer* because new high-tensile strength links plus the new stud, cup-washer and T-screw design give *added strength*—combines this added strength with *maximum flexibility* for cooler, smoother running.

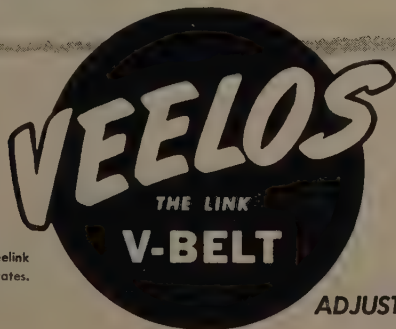
Install this new Veelos TD and TE v-belt on your D and E drives. Prove to yourself why there's no v-belt that can match the performance, the efficiency and the economy of Veelos TD and TE.

Get the complete story of this great new v-belt for D and E drives. Send the coupon now for new 8-page illustrated catalog.



Beveled link
T-screw Cup-washer Stud Individual link

This detailed line drawing of the new Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job... easier!



MANHEIM MANUFACTURING & BELTING CO.
613 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

Name.....

Company.....

Address.....



ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

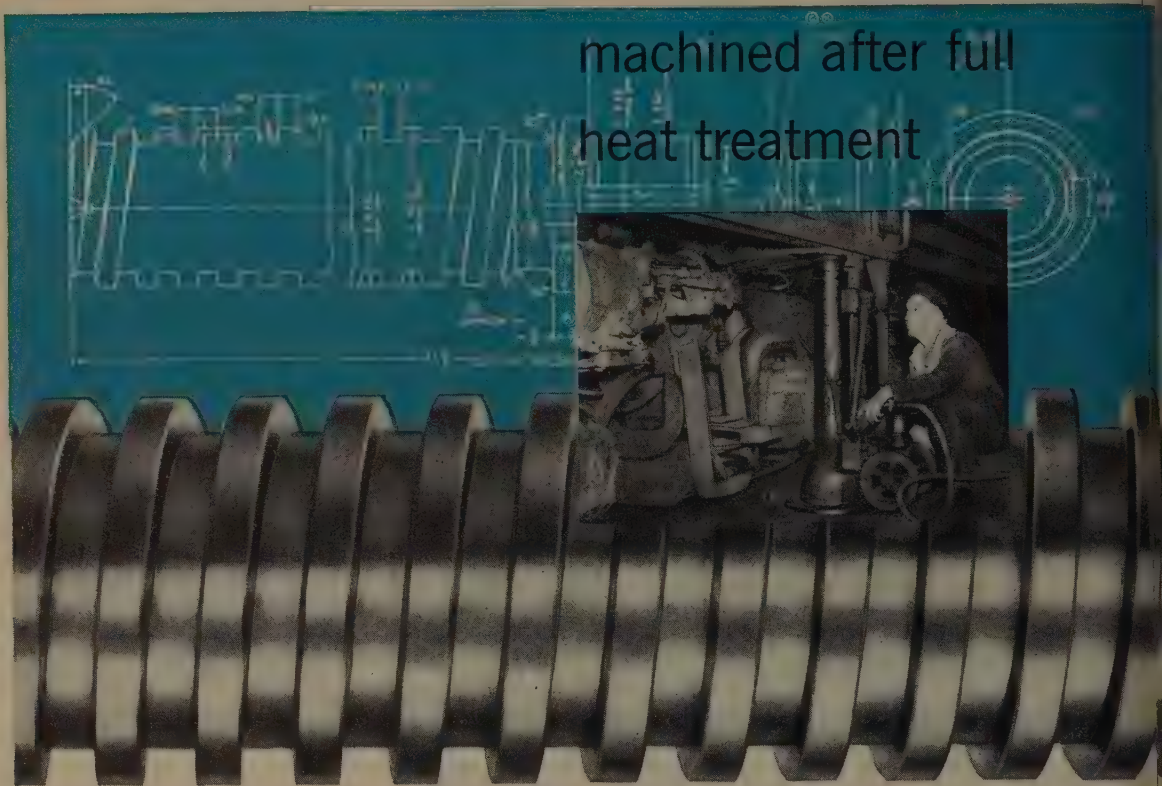
Veelos is known as Veelink
outside the United States.



MAX-EL alloy steel part

for 100-ton jack

machined after full
heat treatment



The Max-el part shown above is the lifting screw from a Duff-Norton air motor screw jack. It's the part that actually lifts and holds the load . . . up to 100 tons.

To make the part, blanks are cut from Max-el 3½ bar stock. After heat treating to 321-341 Brinell, threads are chased and all machining performed. Max-el's optimum machinability after heat treatment, its high-strength, toughness, deep hardenability — which prevents thread sinkage, and high surface finish make it an ideal choice for this rugged application.

But try Max-el yourself. Its excellent machinability means longer tool life, more pieces per grind. And you'll appreciate its freedom from distortion and superior quality. For immediate delivery of Max-el call your nearest Crucible representative.



CRUCIBLE

first name in special purpose steels

54 years of *Fine* steelmaking

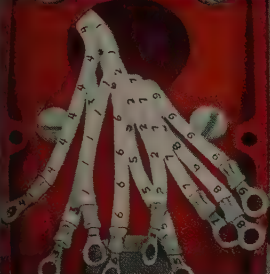
ALLOY STEELS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DAYTON • DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH • PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D.C.

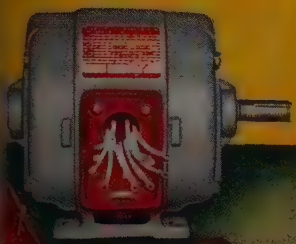
TRI 55 CLAD THE LEADER IN MODERN MOTOR DESIGN

PERMA-NUMBERED LEADS



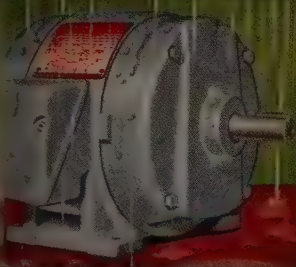
EASIER TO SERVICE, clipped or shaped terminals always can be read. You save hooking-up time.

EASY ACCESS CONDUIT BOX



LARGE CONDUIT BOX is diagonally split—gives you ample knuckle room for easier wiring.

60% MORE PROTECTION



MORE FULLY PROTECTED motor achieved through redesign of cast iron frame and end shields.

LONGER MOTOR LIFE



NEW BEARING SYSTEM means the G-E motor runs longer without relubrication than any other.



Now, easier installation, less maintenance . . .

G.E.'s new **TRI 55 CLAD** motor— you can install it and forget it!

REG. U.S. PAT. OFF.

The all-new General Electric Tri/Clad '55' motor is specially engineered to reduce your installation costs . . . and run longer, without attention, than ordinary motors. This new motor gives you 60% more physical protection plus longer electrical life. In addition, a bearing system designed to use the most modern greases means you will not have to re-grease the Tri/Clad '55' for years.

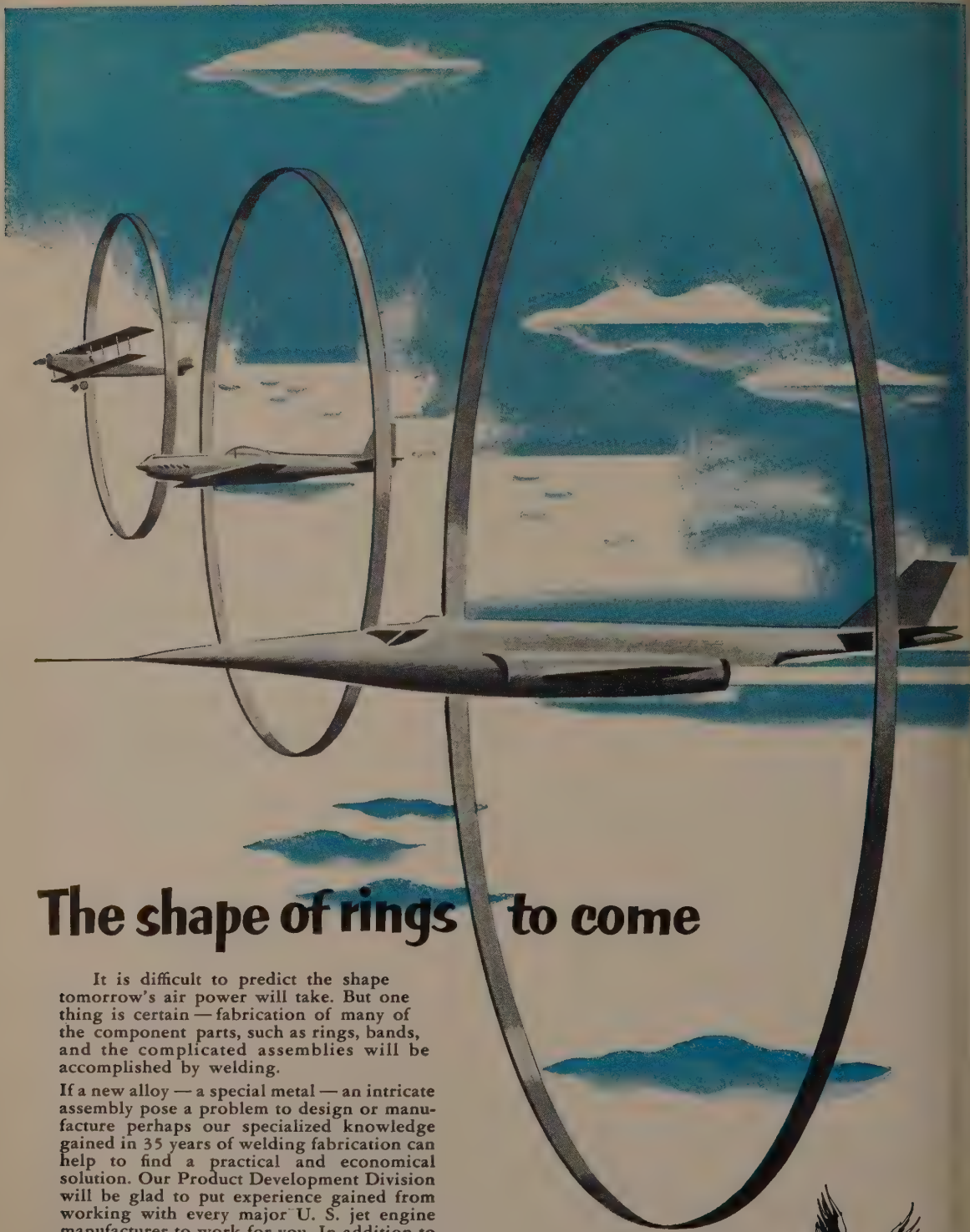
You save with the new Tri/Clad '55' because wiring is easier and faster. The large, diagonally split conduit box gives you plenty of knuckle room. Leads are perma-numbered . . . you can always identify them instantly.

The new Tri/Clad '55' also brings you important handling, storing and installing economies. Better use of space within the frame means a 30% reduction in size and weight in some ratings. Yet active materials (magnetic steel and copper) are not sacrificed.

General Electric Tri/Clad '55' motors are now available in many ratings. The complete line of 1 to 30 hp a-c motors will be available soon. For full details contact your G-E Apparatus Sales Office or G-E Motor Supplier today. Write for Tri/Clad '55' bulletins GEA-6013—Dripproof motors, GEA-6012—Enclosed motors, GEA-6027—Gear-motors. General Electric Company, Section 648-7, Schenectady 5, N. Y.

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The shape of rings to come

It is difficult to predict the shape tomorrow's air power will take. But one thing is certain — fabrication of many of the component parts, such as rings, bands, and the complicated assemblies will be accomplished by welding.

If a new alloy — a special metal — an intricate assembly pose a problem to design or manufacture perhaps our specialized knowledge gained in 35 years of welding fabrication can help to find a practical and economical solution. Our Product Development Division will be glad to put experience gained from working with every major U. S. jet engine manufacturer to work for you. In addition to fusion and resistance welding of ferrous and non-ferrous metals, American Welding can provide designing, engineering, metallurgical and machining facilities.

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Metalworking

Outlook

except those primarily in aircraft work, foresee 15-20 per cent less government work in 1954 than in 1953. The aircraft industry expects a moderate increase in defense jobs.

Industry Gets the Initiative

The government is finally recognizing industry's potential for cutting costs in packaging. It's prescribing performance specifications instead of specs telling the manufacturer exactly how to package the product. Allowing the contractor latitude to explore the field for new and cheaper materials promises to reduce overpackaging.

A Boost for Middle Management

Middle-management executives are getting more attention, financially speaking, from their bosses, says American Management Association. Nearly half of 1300 such executives surveyed have received salary increases since last July. Those gains represent an over-all average pay rise of about 3.8 per cent. Manufacturing, engineering and marketing men, in that order, fared slightly better than the average.

More Titanium Producers?

Facilities for producing an added 19,000 tons of titanium yearly may be built by Electro Metallurgical Co. (10,000 tons), E. I. du Pont de Nemours & Co. (7200 tons) and Dow Chemical Co. (1800 tons). The deals, which would boost annual capacity to 32,000 tons, await Office of Defense Mobilization approval. A number of other proposals are under study with Monsanto Chemical Co., Kennecott Copper Corp., Horizons Ltd. and Titanium Metals Corp.

Straws in the Wind

Atomic Energy Commission authorized three more companies—American Machine & Foundry Co., Babcock & Wilcox Co. and Bendix Aviation Corp.—to study the practical application of atomic power; that brings to 11 the private firms or groups now taking part in atomic research . . . Ebasco Services Inc. has given up on the New England steel mill plan, and the project seems doomed . . . Federal Trade Commission Chairman Edward F. Howrey is pushing a drive for more understandable English in FTC findings and reports . . . Midvale Co. seeks a way to get more civilian business; officials consider selling the company, merging it or acquiring a smaller subsidiary . . . Chase Copper & Brass is expanding its warehousing service to include stainless steels.

This Week in Metalworking

Twenty big companies are optimistic about 1954 (p. 47) . . . There's a buyers' market in packaging materials, too (p. 49) . . . Want to lease? For how to go about it, see p. 50 . . . There are serious bugs in the House-passed Internal Revenue bill (p. 52) . . . Used machinery dealers and users will be hard hit by depreciation provisions in the proposed new tax law (p. 53) . . . Plastic pipe producers see even higher production in 1954 (p. 54) . . . Move cautiously if you plan to shift your plant or open new facilities (p. 55).



MARVEL

HIGH-SPEED-EDGE
ARMSTRONG-BLUM
MFG. CO. CHICAGO, U.S.A.

...but

Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate—without the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!



ARMSTRONG-BLUM MFG. CO. • 5700 Bloomingdale Ave. • Chicago 39, U. S. A.

IF YOU BUY STEEL FOR STAMPINGS

Here's How

YOU CAN HELP YOUR FIRM SELL THEM IN A BUYERS' MARKET

Who said a buyers' market is a blessing for buyers? While you drive a hard bargain on what you buy, your customers' buyers probably drive just as hard on what your firm sells them. Buyers, sellers—we're all in the same boat.

That's why our special job these days is to help make life easier for your salesmen. And here's how:

With Reliance **ECON-O-GRADE** Sheets you can average-down steel costs on your less complicated, plainer finished stamped products. This may boost your profit margins, or give your salesmen a competitive edge to "cinch" orders.

With Reliance **COMMERCIAL-OR-BETTER** QUALITY Sheet and Strip for your fussier jobs, you get in-stock steel at prices keyed to lowest prevailing mill costs. Spot buying for immediate needs checks inventory build-up, lets you price and sell your goods today on today's costs, multiplies and safeguards quick turnover profits.

Whichever grade you buy, the steel must suit your work in finish, gauge, size and workability. It's a case of **VALUE ANALYSIS** on your part, **JOB-FITTING** on ours.

How about talking over some of your cost problems today?



Here's the gist of the Reliance JOB-FITTING idea—

- ... It's knowing our "stuff" ... our "feel for steel."
- ... It's knowing your job ... what you expect the steel to do for you.
- ... It's supplying in-stock sheet and strip best suited to your immediate need.

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

RELIANCE STEEL DIVISION

Processors and Distributors **JOB-FITTED** Sheet and Strip Steel

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SHEETS: COLD ROLLED — HOT ROLLED — H. R. PICKLED — LONG TERNE — GALVANIZED

Standard and Production Sizes or Cut to Actual Working Dimensions

**GENERAL OFFICES
DETROIT 9, MICHIGAN**

April 12, 1954



Kremlin's Achilles' Heel

Shortly after an H-bomb had been set off at Bikini on Mar. 1, reports were circulated that it was far more powerful than scientists had expected it to be. Japanese fishermen suffered burns and several hundred islanders were exposed unexpectedly to radiation. As the days passed, critical comment from widespread quarters throughout the world mounted.

Sensitive to this international anxiety, President Eisenhower invited Adm. Lewis L. Strauss, chairman of the Atomic Energy Commission, who had just returned from the Pacific proving grounds, to attend his press conference on Wednesday, Mar. 31. Admiral Strauss described the unbelievable power of the Mar. 1 blast at Bikini. Within minutes persons all over the world knew that man now has the means to wipe out any metropolitan area. Reaction to the Strauss disclosures was such that the administration decided to release immediately films of a Nov. 2, 1952, H-blast at Eniwetok, which originally had been scheduled for release a week later.

The combination of the Strauss remarks and the showing of the Eniwetok film aroused such new interest and apprehension throughout the world that President Eisenhower decided to talk to the people Monday evening, Apr. 5, about the implications of the H-bomb in regard to our nation's future.

Some of the "strengths" he attributed to our side are extremely important. For instance, he stressed the spiritual strength, which comes from individual rights. The Soviets have nothing to match it. He also emphasized our economic strength, and of course Russia has a long way to go to equal it.

As to "weaknesses," the Kremlin has one which President Eisenhower, as an experienced military man, is qualified to assess accurately. "The Russians," he said, "have a system of satellites, captive satellites . . . That system could be, in a war of exhaustion, a very great source of weakness."

This is a manifestly gross understatement of a very great flaw in the Russian plan for world domination. The greater the control by the Kremlin of unwilling satellites by force, the greater will be the disintegration of Russian military prowess. Here is the real Achilles' heel of the men in the Kremlin!

EDITOR-IN-CHIEF

AUTOMATION—HOW FAR? No. 3 in this publication's series of articles on problems of management deals with the timely and

almost glamorous subject of automation. Although automation means different things to different people, it is safe to accept the rather

broad, general definition that it is the automatic processing of any product in procedures, production, handling and distribution.

Naturally almost every company in the metalworking industry is wondering whether or not it can employ automation to advantage. In preparing the exhaustive eight-page article on this subject (pp. 87-94), the editors have kept this question very much in the foreground. After thoroughly canvassing many angles of the possible expansion and application of automation, the editors come very definitely to the conclusion that for the great majority of metalworking executives, the practical question is not "should you adopt automation in your manufacturing operations?" Instead, the real question is "to what extent shall we embrace automation?"

* * *

NOT FOR GIANTS ONLY: One factor which may retard progress in automation is the prevalent idea that this advanced method of manufacturing is something that can be adopted advantageously only by the giants of industry. Much of the current publicity in regard to automation refers to achievements in the engine plant of Ford Motor Co. in Cleveland, the ordnance plant in Rockford, Ill., and the Ford stamping plant in Buffalo. These are, indeed, big scale operations.

However, automation can be practiced advantageously on a modest scale. Long before automation was introduced into the metalworking industries, it was functioning effectively in food processing, bottling, canning and in some chemical plants. In some of these industries automation is not a large-scale or expensive operation. Automation is relatively new in metalworking—largely because until recently orthodox methods of manufacture seemed to meet the challenge of higher wages.

Now automation knocks at industry's door because it has the answer to varied manufacturing problems.

* * *

RECORD STEEL SALES: When STEEL's editors completed their 29th annual financial analysis of the American iron and steel industry (insert facing p. 54) they came up with the information that while new records in sales and in production were established in 1953, earnings were second to those of the industry's best profit year, 1950.

Sales in 1953 exceeded \$13 billion. The previous record had been \$11.8 billion in 1951. Fig-

ures of 1952 have little value in comparisons because of the losses resulting from the strike in that year. Net profit in 1953 was \$745 million, compared with almost \$767 million in 1950—the industry's best year.

In the foregoing we have been dealing with the performance of 31 companies representing 93.4 per cent of the nation's steel ingot capacity. In toto, the industry's earnings in 1953 were less than in 1950, but some companies earned more in 1953 than in 1950. Please check the detailed tabulation for these exceptions.

* * *

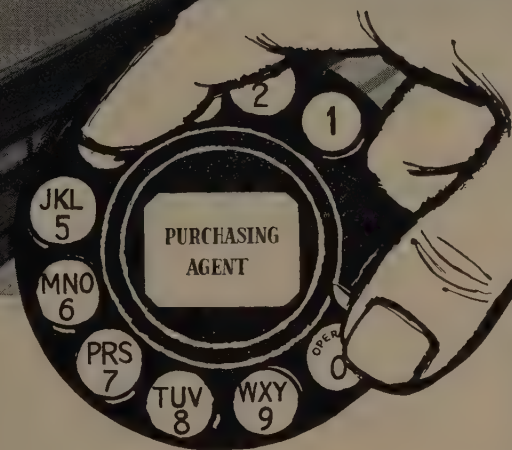
ACCENT IS ON "WHERE?" Recently persons experienced in designating favorable locations for new industrial plants expressed their views at a meeting of the American Industrial Development Council in Washington. Most of the speakers cautioned industrial corporation executives to proceed very carefully when they are considering the removal of a plant from a congested or outmoded area to a spot in the suburbs or into rural territory.

Most trustworthy industrial real estate experts (p. 55) discount the so-called advantages that are proffered by chambers of commerce and citizens' groups in the form of free rent or tax remissions. In some specific cases these may be important, but in general they do not measure up to the other important considerations which determine where a new plant shall be located. We really need much more scientific data on industrial plant location.

* * *

BARRIERS TO TRADE: In response to a congressional demand for a survey to show the nature and magnitude of impediments to the investment of private American funds in foreign countries, the Department of Commerce has brought out a book entitled "Factors Limiting U. S. Investment Abroad" (p. 56), which is a surprisingly candid appraisal of pitfalls which are encountered in some 30 foreign countries.

In many instances the irritations which bedevil Americans attempting to do business abroad are caused by local regulations, habits or traits. However, the trouble does not always arise from local conditions. The book shows that not all United States investors fare alike in the same country. Some prosper where others fail, probably indicating that there are many Americans who have much to learn about foreign trade. The book should be of considerable assistance to investors.



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Annual Report--for 1954

A survey of 20 large companies reveals strong optimism for 1954 despite the indifferent first quarter. Heavy investments in expansion and research continue

HOW DO the pacesetters in American industry view the economic future?

Because of the business pessimism in some quarters, STEEL went to 20 large companies for their opinions. These firms have to be objective about their forecasting because if they are wrong they can lose billions in poorly timed expansions, inadequate product development or blind-alley research. Here's a summary of what they're thinking and doing about the future.

Allis-Chalmers Mfg. Co. points to the proverb which says: "There is time to fish and there is a time to mend nets." President W. A. Roberts thinks 1954 is the time to do both—aggressive selling, extensive product development and organizational streamlining.

American Can Co. President William C. Stolk "looks forward with confidence" to 1954 because of his company's increased efficiency, technological improvements and fully adequate supplies of materials this year. He thinks the competitive situation is now such that a marked rise in costs, as in large gains, will have to be absorbed at least partially by the company.

Like most of the rest of the aircraft industry, **Boeing Airplane Co.** expects 1954 sales volume to exceed 1953 levels. It had a \$2.4-billion order backlog as of Jan. 1. The company has \$3.2 million in authorized capital expansion projects still to be completed and expects more to come along, particularly because of rapid progress in guided missiles. Since Jan. 1, 1941, Boeing has plowed back 70 per cent of its net earnings into the business.

Caterpillar Tractor Co. says much of its 1954 sales performance will depend on its product and service reputation. It sees its biggest business coming from replacements and from the natural growth of existing markets. It looks for a



slightly lower volume in 1954 than in 1953, but profits should remain about the same.

Chrysler Corp. looks to organizational changes to improve its competitive position in 1954. It

plans a divisionalized structure of semiautonomous profit centers to provide a better framework of development. Says President L. L. Colbert: "I believe industry can be



competitive without going to lower levels of economic activity."

Clark Equipment Co.'s President George Spatta believes that "proper cost controls, plus the elimination of the excess profits tax and good prospects for the sale of our newly developed line of products, will permit us to have profitable operations in 1954."

Detroit Edison Co. plans to double its present capacity to generate power within ten years. It foresees ever increasing demands from its domestic, commercial and industrial—especially industrial—customers. Within a decade some of the power it generates may come from nuclear sources because it's heavily involved in that development.

Dravo Corp. foresees 1954 as a period requiring close bidding on engineering and construction jobs.

Dresser Industries Inc., maker of oil, gas and chemical equipment, predicts a 1954 on par with 1953 because of continuing high capital expansion and improvements in the field it serves.

E. I. du Pont de Nemours & Co.'s

President Crawford H. Greenewalt says: "The business community must accept major responsibility for seeing that panic does not start. Industry must keep its eye firmly fixed upon the long-term upward trend—the amazing and dynamic progress shown in this country over many years. To look to the future, DuPont plans even more vigorous research in 1954 than in 1953 when \$57 million was put on the line.

General Electric Co. expects total sales in 1954 to be down slightly from 1953, but it anticipates better earnings this year than last. Its defense business in 1953 was more than 30 per cent of its total volume. Over the next several years, officials predict, war work will stabilize at about 20 per cent of the total. Since defense business is less profitable than civilian, the company believes that



that factor and lower federal taxes will improve 1954 earnings.

General Motors Corp.'s plans to spend a record \$1 billion on expansion in 1954 and 1955 testify to its confidence in the future. Says President Harlow H. Curtice: "If those who persist in taking a pessimistic view of the future succeed in planting fear in the minds of the public, those seeds of fear could take root and the result might be the very condition we seek to avoid."

International Nickel Co. Ltd. "expects to operate at full capacity and to sell all the nickel we produce in 1954." Inco believes that its long-term developmental activities are paying off, and it's moving to keep up this work.

The increased impact of automation will be a boon to Minneapolis-Honeywell Regulator Co. in 1954. Its aeronautical backlogs are as high now as a year ago. Honeywell stresses the importance of being in at the beginning of big industrial development

trends, such as automation and electronics.

National Cash Register Co. sees as a major market office machinery to simplify the job now being done by 8 million clerical workers in the U. S. Also, the trend toward the giant super markets will support demand for its cash registers.

Republic Steel Corp. says that 1954 will be a period when industry can catch up with itself after



nearly 15 years of all-out emphasis on production. More leisure and the virtual elimination of overtime will allow more attention to efficiency and economies. Republic stresses the need for product diversification. It has broadened into production of iron powder, titanium, kitchen cabinets and plastic tubing.

Thompson Products Inc. expects sales of new automotive products to offset the decline in volume for existing products caused by fewer auto assemblies in 1954 than in 1953. "Looking further ahead, the upward population trend and the continuing demand for transportation furnish ample basis for expecting a continuing long-term growth in the automotive industry."

Union Carbide & Carbon Corp., which passed the \$1-billion sales mark last year, pins its hopes on



technology to keep sales even higher in 1954 and beyond. Special emphasis in the future will be given to synthesis of organic chemicals and the development of improved plastic products; to the field of metallurgy and the use of

electric furnace products; to the art of separating and treating atmospheric and hydrocarbon gases for metallurgical, chemical and other uses; and to the increased use of carbon as an inert substance required by industry in many forms.

U. S. Steel Corp. estimates that \$327 million will be needed to complete all replacements and additions authorized by Jan. 1. Chairman Benjamin F. Fairless points out that four basic requirements for prosperity are peace, price stability, free and open markets and a good climate for private enterprise as provided by the government. We now have the first three requirements, he says, and the government is striving to provide the fourth.

Westinghouse Electric Co. says: "Even if the level of general business for 1954 is moderately lower than in 1953, we are planning for and aiming toward large billings and profits in the coming year."

Fast Write-Offs Still Hefty

U. S. Steel Corp. received the largest certificate of necessity issued by the Office of Defense Mobilization in the period from Mar. 11 through Mar. 24. On metallurgical by-product coke facilities at Joliet, Ill., it received a certificate for \$15,925,000, with 45 per cent allowed. For similar facilities the National Tube and Tennessee Coal & Iron Divisions were certified, respectively, for \$12,930,000, with 50 per cent allowed, and \$10,660,000, with 45 per cent allowed.

During the same period large certificates were also granted to the following companies: Capital Tank Car Corp., \$3 million, with 7 per cent allowed; Young Radiator Co., \$2.2 million, with 45 per cent allowed; and, Commercial Barge Lines Inc., \$1.2 million, with 7 per cent allowed.

Including the latest certificate, accelerated tax amortization amounting to \$29,502,163,000 has been granted for 18,991 new or expanded facilities. Of the amount certified 60 per cent or \$17,715,570,000 is eligible for rapid depreciation.

Packed with Sales Appeal

MA conference shows packaging trends are slanted toward the customer's needs

WRAPPING industry's products in greater sales appeal at lower cost is altering emphasis in the packaging field.

The trend is toward building packaging around the customer's needs, some 25,000 packaging experts learned at the 23rd National Packaging Conference and Exposition in Atlantic City last week. Sponsored by American Management Association, the show demonstrated versatility of packaging in creating preferences, analyzing impulse buying and saving ahead of competition.

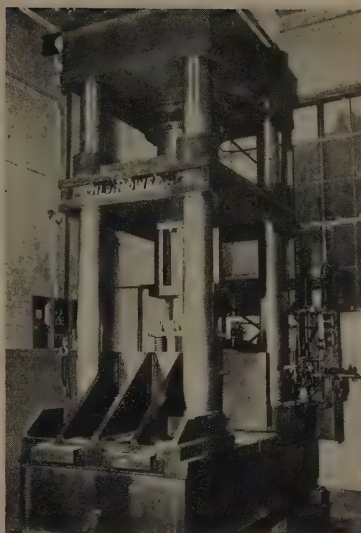
Fast Growing—Today's packaging sales are estimated at some \$1 billion, and the growth potential is high.

One survey of industrial packaging costs shows the average percentage of manufacturers' selling price represented by packaging ranges from 40 per cent for inks and adhesives to 1.4 per cent for office machines. Monsanto Chemical Co. estimates every 1 per cent reduction in the per cent of container weight to gross weight is worth \$7000.

Needed for Speed—Quality and uniformity in materials are key factors of materials for today's speedier packaging lines, said John A. Warren, American Home Products Corp., New York, in detailing radical changes ahead in the industry. Continuous annealing of steel strip would permit use of inter gages in containers. Differential coated electrolytic tin plate, organic coatings and side-seam cements should widen the market for the tin can.

Aluminum foil for lining containers is enjoying unprecedented growth, said Mr. Warren. He pointed to films as the fastest growing branch of the packaging industry, but with "many lessons to learn." Polyethylene will grow in use; polyester films are arousing great interest, as is the vacuum-formed plastic package.

More Metal Cans—Packing metal products in metal containers is opening new markets for cans,



To Press Titanium Powder

Squeezing shapes from titanium powders will be task for this 1250-ton split die hydraulic press recently installed at Firth Sterling Inc., McKeesport, Pa. Manufacturer is Oilpower Engineering Co., Schenectady, N. Y.

according to R. S. Solinsky, president, National Can Corp. Welding electrodes, bearings, gear cutters and powdered metals are now packaged in cans, while experiments are now under way on saw blades and similar products.

Can manufacturers shipped 38 billion metal cans last year. Cost cutting ideas include motor oil cans from black plate with cemented side seams, resin coating sheet stock before deep drawing, drawn and concaved-seamed bottom low-pressure cans.

Machinerymakers Thrive

Packaging machinery makers are wrapping up a good year.

Many of them are operating at higher levels than in any postwar year, and order backlog is at a new all-time high, says R. T. Foreman, director of sales, R. A. Jones & Co., Cincinnati, and president of Packaging Machinery Manufacturers Institute.

Orders are up 14 per cent and shipments in 1954 will probably be 11 per cent higher than in the period 1950-1953, predicts Mr. Foreman. Results will be a carry-over into 1955 that should insure good business next year, too.

More Birthmarking?

BDSA will get behind the Air Force program for mill marking of rolled metal products

THE ARMED SERVICES' campaign to get mill producers of metal rolled products to birthmark these shapes advanced another step when Business & Defense Services Administration gave assurance it will co-operate.

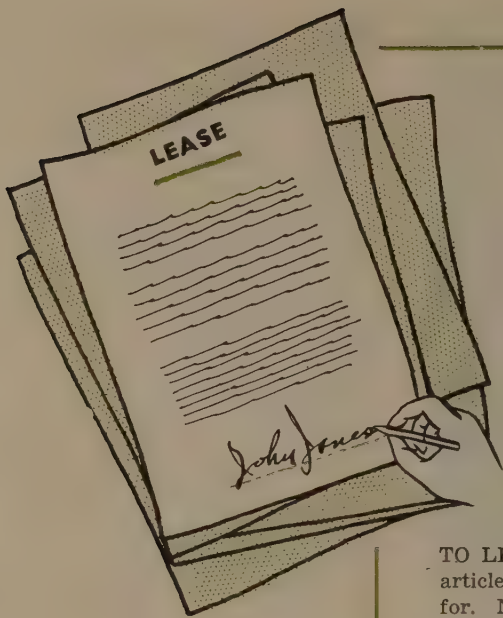
Following a conference at which armed services spokesmen explained the move to the Iron & Steel, Aluminum and Copper divisions, BDSA agreed to find out what it could do to help universal adoption of mill marking.

Reasons—Purpose of the campaign, BDSA divisions were told, is to permit ready identification of metal products in consumers' inventories; to facilitate sorting out of inventory in case of bombing raids; and to facilitate salvage of scrap.

Armed services spokesmen declared that the objection that such marking entails high cost for which big extras would have to be charged is not valid. They told of seeing carbon sheet marking procedures at a number of mills which, by means of a marking wheel geared to the rotary shear, print marks on 30-inch centers down the middle of the sheet at speeds of 400 to 450 feet per minute. The cost of marking in these instances was reported as "negligible."

AF Pressure—The Air Force has been intensifying its policy of denying orders to steel mills that either do not incorporate a marking commitment in their bids, or which include a marking extra the Air Force regards as exorbitant. In March, the Air Force steel procurement center at Topeka, Kans., deprived at least 12 steel companies of orders because they did not quote acceptable terms for marking.

That Air Force center, which buys several thousand tons of galvanized sheets, aircraft quality bars and other products monthly, placed the business with warehouses which have marking equipment. The Air Force justifies the higher cost of warehouse steel by the benefits of marking.



Renting .

How To Go About It

TO LEASE or not to lease? That's a question which STEEL's articles Mar. 29 and Apr. 5 attempted to help you find answers for. Not everyone should lease, but if you have decided to, you have a chance to broaden markets if you're a builder or of modernizing at minimum capital outlay if you're a user. Here are some ideas to help you get started.

LEASING EQUIPMENT is something like flying an airplane—you have to learn how to do it, you have to learn the legal rules affecting it and you have to learn what to do if anything goes wrong.

If after studying the advantages and disadvantages of leasing (STEEL, Mar. 29, p. 67, and Apr. 5, p. 67) you want to try it, you should still go into it with care, whether as a lessor or lessee.

What Builders Should Do—If you're a builder, the first task is to find financing. Your requirements on leased equipment will be much higher than on sold equipment. Banks are conservative about this, but some will do it. A better bet may be industrial financing organizations, such as CIT Corp., New York, or Commercial Credit Corp., Baltimore. Insurance companies are also interested.

Or you may prefer to by-pass the whole question of financing and let some leasing broker handle it. That's essentially what firms like Rentco Inc., Philadelphia, or U. S. Leasing Corp., San Francisco, are. They're growing rapidly in number, too. Bank of America reports that no fewer than 20 firms or individuals in the

last six months have approached it for financial support in forming leasing firms. Under the most common plans, the leasing company finds a firm that wants to use equipment, then arranges financing, finally buys the equipment from the builder and leases it to the user.

But leasing brokers may not be able to give you the volume you require. In that case, you had better find your own financing. If you are going into leasing on a modest scale, you may even be able to handle it yourself. A few companies are planning to do that for the time being. Yet, that isn't practical if you plan to go into it on a permanent and substantial scale. Remember that Signode Steel Strapping Co., which has done this kind of marketing since the 1920s, has equipment with an original cost of \$6 million and a depreciated value of \$3 million in the hands of its customers now.

The Mechanics—If you decide not to sell to some leasing broker, then your next step is to determine the mechanics of handling your leases. You can set up a subsidiary, as Yale & Towne Mfg. Co. has; you can do it through

your regular organization, as Signode does; or you can handle it through local representatives, as Clark Equipment Co., Buchanan Mich., does. The latter method is a fairly unusual arrangement. Sentiment among machine tool distributors, for example, is not too touch leasing on that basis, but to let the manufacturer take over. Once the mechanics are taken care of, the builder must sell leasing. It will probably be tougher than selling purchasing.

What the User Should Do—If you're thinking of becoming a lessee, your first problem is to determine whether it's more advantageous to rent or buy. While that's primarily a matter of dollars and cents, there are intangibles that should be weighed, too. Is service better under lease or purchase? Will you get better technical advice from the builder if you lease than if you buy?

There are some dangers in your contract, also, that should be watched for. Are there any restrictions on what you make with the leased equipment? Are there any clauses or equipment gimmicks that require you to buy the

lessor's product or accessories that are used in the machine?

Equal Consideration—When the primary considerations for both lessor and lessee are taken care of, it's time for a joint consideration of the details of a contract. In his memorandum on "The Leasing of Industrial Equipment," Frank Griesinger of Lincoln Electric Co. suggests these four points bear watching:

Term of the Lease—Lease contracts can run from two to about ten years. The average runs about five. There's no such thing as ideal terms, but the accompanying sample of Kearney & Trecker Corp.'s plan gives you one company's solution.

Lease Payments—Generally the net purchase price of the equipment is divided into monthly, quarterly or semiannual installments. Often a choice is given the lessee as to how he wants to make his payments. In some plans, pay-

ments in the earlier years may be greater than the later years, to reflect the faster depreciation of the equipment. If rental rates parallel the double-rate declining balance method of depreciation, they are certain to be on a declining basis. Watch out for rental payments that in two years or less are equal to the value of the equipment. The Internal Revenue Service will be dubious.

Lease Renewal—Almost all plans provide for continuing lease of the equipment beyond the initial leasing period. Frank Griesinger of Lincoln Electric Co. says that rates quoted for renewals of the basic lease term or for year-to-year renewals vary widely—from 4 per cent to 50 per cent of the value of the equipment. Watch out for IRS trouble if renewal rates are nominal. As in nominal purchase prices, IRS has been known to view such arrangements as conditional sales.

The Purchase Option—As already explained (STEEL, Apr. 5, p. 67), this one is tricky. Until IRS makes a statement clarifying its position, it's wisest to avoid a purchase-option clause altogether. The practice now is to include it, as in the Kearney & Trecker plan, but to explain its pitfalls to customers.

Lease Financing Costs—The service charge by manufacturers specified in many leasing contracts varies widely—from as low as 1.667 per cent of the net equipment value to as high as 6 per cent. All rates are expressed as "add-on" rates. Bank interest rates are usually "simple" interest. An add-on rate of 4 per cent is equivalent to a simple interest rate of 7.38 per cent; 5 per cent is equivalent to 9.23 per cent. Many companies can borrow from banks at a lower rate than that charged under most leasing plans. But bank loans are usually for

KEARNEY & TRECKER TOOL-LEASE PLANS

(Percentage figures are percentages of list price of machines)

YEAR	PLAN A			PLAN B			PLAN C		
	Rental Amount †	Cumulative Rent	Purchase Amount	Rental Amount †	Cumulative Rent	Purchase Amount	Rental Amount †	Cumulative Rent	Purchase Amount
1	25%	25%	...	30%	30%	...	35%	35%	80%
2	25	50	...	25	55	60%	25	60	60
3	25	75	45%	20	75	45	15	75	45
4	10	85	40	10	85	40	10	85	40
5	10	95	35	10	95	35	10	95	35
6	10	105	30	10	105	30	10	105	30
7	10	115	25	10	115	25	10	115	25

Customer may terminate or purchase anytime after: plan A—3rd year, plan B—2nd year, plan C—1st year. Customer, if he chooses, may lease for full seven years; after that, leases are renewable. † Rent paid twice yearly in equal installments.

Example: Plan B, List price of machine \$10,000.00

Year	Rental Amount	Cumulative Rent	Purchase Option Price
1	2 payments of \$1500 = \$3,000	\$3,000	...
2	2 payments of \$1250 = \$2,500	\$5,500	\$6,000
3	2 payments of \$1000 = \$2,000	\$7,500	\$4,500
4	2 payments of \$500 = \$1,000	\$8,500	\$4,000
5	2 payments of \$500 = \$1,000	\$9,500	\$3,500
6	2 payments of \$500 = \$1,000	\$10,500	\$3,000
7	2 payments of \$500 = \$1,000	\$11,500	\$2,500

shorter terms than are available on leasing plans.

Length of Lease — All leases should have a fixed term specified in the contract. Practices range widely as to cancellation privileges. Few, however, permit cancellation before the contract has run two years. Many allow no cancellation at all.

Insurance—Most contracts provide that all insuring is to be done

BANK



First Step: Financing

by the lessee, with prompt notification to the lessor of damages and insurance claims.

Taxes—Most contracts provide for the assumption of local taxes by the lessee.

Equipment Modification — Such changes must usually be approved by the lessor, including any identification or advertising placed on the equipment.

Multiple-shift Operation — In some contracts leasing rate increases when the equipment is being used on more than one shift.

Whether you're a lessor or lessee, it's wise to try to get pre-clearance from IRS on any leasing plan. That's because of the ambiguity about when a lease is a lease or just a conditional sale.

The U. S. policies now are unnecessarily hindering the spread of leasing. While nobody can condone a mere tax-dodging leasing plan, the vast majority are absolutely legitimate and don't deserve the suspicion IRS too often gives them.

Sensibly policed by the government and wisely used by industry, leasing can help our economy fly to still greater heights of productivity.

Time for Tax Action Is Now

The proposed new revenue code is being studied by a Senate group which will report in May. The House-passed measure has some bugs. Here are complaints being heard

TARGET DATE for the Senate Finance Committee's report on the new Revenue Code Bill, H.R. 8300 as passed by the House, has been set as May 1. But the many complaints coming from businessmen, which will have to receive attention if the committee is to do a conscientious job, makes it likely the bill will not be reported much before May 15.

Even so, businessmen who seek relief from the provisions passed by the House had better act immediately if they expect attention.

Tax Speedup—1. Greatest number of objections are to the further speedup in payment of taxes. (See table below).

Treating Mergers—2. The second largest area of complaints revolves around the 300 section of the bill dealing with corporate organization, acquisition, distribution, adjustments and the like. It introduces new rules governing tax treatment of mergers, stock distribution and consolidation. General feeling is that these rules are more stringent than comparable rules in the 1939 code now in effect.

Depreciation Falls Short — 3. Many complaints center on new depreciation rules. Consensus is that liberalized depreciation rules are fine as far as they go, but they do not go far enough. Some businessmen do not like the declining-balance method of depreciation because under it you never finish writing off a machine altogether. Others, like used machinery dealers, would like to get under the faster amortization methods pos-

sible under the declining-balance provisions (see story on p. 53).

Differences of Opinion—4. Manufacturers do not like the bill's provisions which state that the manufacturer's view prevails when the difference between his estimates of the useful life of an asset and that of the Internal Revenue Service is not over 10 per cent. When the difference is over 10 per cent, procedure under the new law gets involved. Most manufacturers think it would be best to adopt a 25-per-cent maximum for estimate differences instead of the 10-per-cent figure.

Narrow Definitions—5. General manufacturers feel the proposed treatment of foreign income—with an allowance of a 14 point reduction in the tax rate compared with the rate on domestic income—is unsatisfactory. But they think the definitions of business in foreign countries are too narrow.

Penalties Remain — 6. There is widespread disappointment over failure of the House to do away with penalty taxes. That is, 2 per-cent penalty for the privilege of filing a consolidated return and 15-per-cent penalty on intercorporate taxes.

Surplus Sorrows—7. Disappointment is general, too, over failure of the House to act adequately in regard to the penalty tax for improper accumulation of surplus. Fear of the penalty tax long has been held to cause companies to distribute surplus funds which are urgently needed for business expansion.

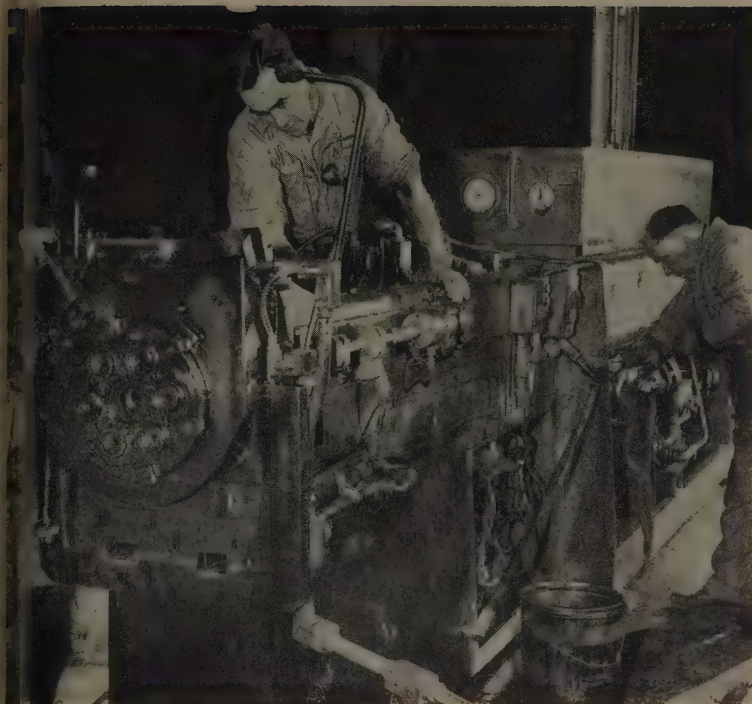
How Much of Your Tax Bill You'll Pay—and When

Current and Proposed Corporate Tax Schedule

	Mar. 15	June 15	Sept. 15	Dec. 15	Total
1954	45 %	45 %	5 %	5 %	100 %
1955	50	50	5*	5*	110
1956	45†	45†	10*	10*	110
1957	40†	40†	15*	15*	110
1958	35†	35†	20*	20*	110
1959	30†	30†	25*	25*	110
1960 and thereafter..	25†	25†	25*	25*	100

* Payment of estimated taxes for current calendar year.

† Balance of taxes for preceding calendar year.



A depreciation quirk in the omnibus tax proposals could put a . . .

Short Circuit in Used Machinery

H.R. 8300 grants new equipment buyers faster depreciation but excludes used machinery purchasers from the same right. Used machinery dealers protest

"TANK DISCRIMINATION!"
 It's how used machinery dealers classify the depreciation provisions of House-passed Internal Revenue bill, H.R. 8300, Section 167. The bill limits liberalized depreciation methods to "property new and therefore never before subject to depreciation allowances." Dealers in rebuilt, reconditioned or used machinery say that this limitation, if allowed to stand, will act as a deterrent to their own businesses and to the great majority of equipment users who buy used machinery, including most small and new businesses.

Two Methods—H.R. 8300, as now written, grants new equipment buyers use of the declining-balance method of depreciation with a rate table that which must be applied to used machinery buyers on the straight-line method of depreciation.
 It works out like this: A used tool, costing \$10,000 and with a

useful life of 10 years as decreed by Internal Revenue Service, in five years is depreciated \$5000. That's on the basis of straight-line depreciation at 10 per cent per year. A new tool, costing \$10,000 and on the declining-balance method of depreciation of 20 per cent per year, is depreciated about \$6700 over the same period of five years. The difference in depreciation between used and new is enough to make many manufacturers hesitate to buy a used machine. In fact, the Machinery Dealers National Association says the tax reporting service of Research Institute of America has already advised its subscribers in Question 35, p. 5, of its Mar. 18 report to hold up consummating proposed transactions involving used and rebuilt industrial equipment.

Widespread—If this were to happen on only a small percentage of the equipment on the American

market in any one year, it wouldn't be important. But used machinery dealers point out there are some 200 members of the Machinery Dealers National Association and about 500 dealers and brokers outside the organization. Together the industry did about \$300 million in sales in 1951 with a 5 to 10-per-cent downward trend in sales evident each year since then.

Some used machinery dealers estimate there are three or four times as many individual sales of used machinery as sales of new machine tools each year. Used machinery serves the vital function of allowing small and new companies to start small by buying cheaper, used equipment and gradually upgrade until they're buying new tools.

A Heavy Hand—This depreciation disadvantage threatens the sales outlook for used machinery dealers. Last month came promise of a recovery from the readjustment slump. Prices had declined from 10 to 30 per cent from a year before. "Most dealers took what they could get if they needed the money," said one Pittsburgh dealer. Interstate Machinery Co. Inc., Chicago, said prices were down a maximum of 30 per cent, but things improved in the latter part of March and "further dips aren't expected." A New York firm reports its business was way off in January and February but began an upturn in March.

The question was whether these signs of an upturn would get nipped by the uneven tax provisions. Said Galbreath Machinery Co., Pittsburgh, late last month: "Yes, there are some signs of a pickup in orders, but buying hasn't improved any yet."

Gets To Work—Said R. K. Vinson, executive director of MDNA, "Used machinery sales are very sensitive to business trends because used machines are available for immediate delivery and they go to work right away. There have been quite a few inquiries for new business in the last month or two. But buyers are hesitating on the basis of the tax situation."

MDNA is already requesting remedial action on H.R. 8300 with the Senate Finance Committee, now studying the measure.

PLASTIC PIPE:

Free Flowing Sales Future

1954*	30 million pounds produced
1953	25 million pounds produced
1952	15 million pounds produced
1950	5 million pounds produced

*Estimated

Source: Society of the Plastics Industry



Republic Steel

RESEARCH development and public acceptance remain the key factors in the future of the comparatively new plastic pipe industry.

Sales in 1953, according to the Society of the Plastics Industry, hit the \$25-million mark, and industry men are predicting a 20-percent increase for this year. For metalworkers in the pipe business, particularly in the smaller sizes, the plastics industry poses a real challenge for many future markets.

Best Seller — By far the most widely used type of plastic pipe is the flexible polyethylene pipe which is finding its way into more and more water system uses. These include jet wells, water lines and irrigation on the farms, coal mine draining, home and golf course sprinkling. This type of pipe accounted for all but 3 to 4 million pounds of total plastic pipe shipped last year, SPI says.

The semirigid butyrate pipe is the second most widely used plastic pipe. More costly than polyethylene, butyrate's biggest potential, say plastics officials, is in the oil fields where sour crudes, paraffin and brine are piping headaches.

Problems — In efforts to get greater heat resistance and high-

er tensile strength, current research projects include fibrous glass treated with polyester resin, styrene copolymer, phenolic extrusions and others.

Several co-operative projects sponsored by the industry to set up standards for plastic pipe and to break down public resistance to some suggested applications are under way. To crack the water pipe market, the industry is co-operating with the National Sanitation Foundation in a study to determine whether thermoplastics present a health hazard.

Plastic pipe producers are booming their sales chart curves upward with these claims for their product: Corrosion resistant, shock resistant, lower installation cost, lower maintenance cost, lighter weight. One spot check shows this price comparison: In the half-inch size, galvanized steel cost 10.4 cents, black pipe 8.7 cents, stainless steel \$1.28, copper tubing 27 cents, aluminum 18.4 cents, brass 6.5 cents, polyethylene 14 cents, and butyrate 19 cents per foot.

Metal Entries—Seeing the potential in the plastic pipe future, Republic Steel Corp. and Youngstown Sheet & Tube Co. were the first of

the big metal pipe producers to enter the plastics field.

Republic officials report that sales at its Magnolia, Ark., plant are "going as expected." Most popular line for the company is the polyethylene pipe in the 3/4-in. through 1 1/2-in. sizes.

Fiber Glass—Youngstown Sheet & Tube produces pipe of fiber glass treated with polyester resin, similar in characteristics to that used in plastic auto bodies. "Most of our pipe is used in the oil fields," officials say. Company is planning expansion in the fiber glass type pipe for use on farms and in chemical, petroleum and gas industries.

Just how big a bite plastic pipe producers will take from the traditional metal pipe market is anybody's guess. There's more than one pipe producer experimenting with a plastic coating for metal pipe to buck the competition.

More Coming?—And more metal pipe producers may enter the plastics field. In announcing its quarterly report, Mueller Brass Co., Port Huron, Mich., said it is entering the field and will produce polyethylene pipe. U. S. Steel Corp. has been conducting experiments with plastic pipe, but to date says it "has no plans for commercial production."

STEEL PRODUCERS' EARNINGS AFTER TAXES

MILLIONS OF DOLLARS



29th ANNUAL
**FINANCIAL
ANALYSIS**
OF THE
STEEL INDUSTRY

Supplement to

STEEL
A PENTON PUBLICATION

April 12, 1954

1953: No. 1 for Sales; No. 2 for Earnings

THE steel industry in 1953 set new records in production and sales but not in earnings. Dollar volume of earnings was second best in history. The earnings record set in 1950 still stands.

One of the checkreins on net profit in 1953 was federal income tax rates, which were higher than in 1950. Also holding down net profits in 1953 were unusual and non-recurring costs of starting up new facilities. That year, which was the conclusion of most of the postwar expansion program in the steel industry, was marked with an increase of 6.8 million net tons in ingot capacity. This additional capacity helped the industry set an all-time production record of 1.6 million net tons of ingots, and the resultant record in sales.

Less for Uncle Sam

Although federal income tax rates in 1953 were high, the total dollars collected by Uncle Sam fell somewhat below the 1951 record total. Holding down the 1953 federal tax bill was fast amortization of new facilities that were built under certificates of necessity in the big expansion program that followed the outbreak of the Korean war. In fact, fast amortization played an increasingly important role in the steel industry's financial results in 1953. This fast amortization is applicable for five years after completion of the construction projects, and by 1953 a substantial portion of the latest cycle of the steel industry's expansion had become subject to the fast write-off privileges. The

amounts charged to fast depreciation reduced the amount of earnings that were subject to federal income taxes.

The new sales record set in 1953 by the steel industry was \$13,350,000,000. Previous record was established in 1951 by sales of \$11,844,953,248. Net profit of the industry in 1953 was \$745 million. The record, set in 1950, was \$766,947,936. These 1953 totals for the industry were computed on the performance of 31 companies covered in STEEL's 29th Annual Financial Analysis of the Steel Industry. The 31 steel producers represent 93.4 per cent of the industry's ingot capacity.

Exceptions to the Rule

While the industry as a whole did not set a profit record in 1953 some members of it did.

Total net profit of the industry in 1953 rose over that of 1952 by 38 per cent, while sales climbed 21.6 per cent. As a result, net earnings per dollar of sales moved up to 5.63 cents from 4.96 in 1952.

In comparing 1953 with 1952 it must be remembered that 1952 was marred by a two-months' strike of steelworkers. While 1953 set a record in production and sales, the record might have been even bigger were it not for the fact 1953 marked the close of an unprecedented 13-year period in which the demand for steel, stimulated by two wars and work stoppages, ran ahead of production possibilities. However, the close of the Korean war in early 1953 and the big expansion of the steel

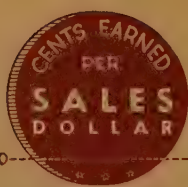
industry's capacity reversed the situation, and quickly the demand for steel was lower than production capacity. The industry's ingot production was at 100 per cent of capacity in the first half of 1953 and tapered off in the last half. The companies represented in STEEL's analysis had a combined average steel ingot operating rate of 93.62 per cent that year.

The new record in sales came not only from a record physical volume but also from increased prices on steel. They were raised in mid-1953 to compensate for an 8.5-cents-an-hour wage increase given at that time to steelworkers. During the first quarter of the year, government controls on prices and wages were still in effect.

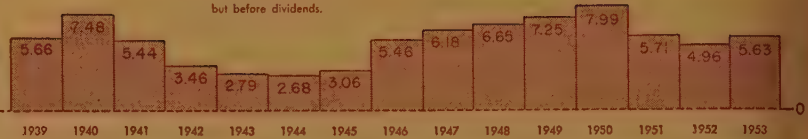
The increase in wages, along with a record high in employment, boosted total payrolls to a new peak. The average number of employees in 1953 was 835,615 persons, compared with the previous peak of 819,595 in 1951. The new record in payrolls was \$4,024,736,666.

More Workers, More Owners

Not only did the number of employees rise but so did the number of owners. In 1953 there were 3 per cent more holders of common stock and 1.2 per cent more common shares outstanding than in 1952. Net earnings per share of common stock were up, too. In 1953 they were \$6.81, compared with \$4.87 in 1952, thanks to the improved earnings performance of the industry in 1953.



After taxes and interest on bonds
but before dividends.

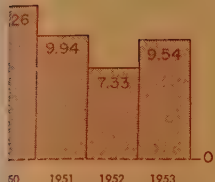


	Rated Ingot Capacity, Net Tons		Ingot Production, Net Tons		Steel Operating Rate, Per Cent		Net Income In 1953
	1953	1952	1953	1952	1953	1952	
United States Steel Corp.	38,715,000	36,399,000	35,827,000	29,436,000	98.43 ^s	84.97 ^s	\$6.20
Bethlehem Steel Corp.	17,600,000	16,800,000	17,662,687	14,116,342	100.36	84.03	7.58
Republic Steel Corp.	10,262,000	10,262,000	9,630,454	7,991,238	94.50 ^s	82.80 ^s	5.89
Jones & Laughlin Steel Corp.	6,166,500	5,900,000	6,033,000	4,710,000	95.97 ^s	83.71 ^s	5.14
National Steel Corp.	5,650,000	5,100,000	NA	NA	NA	NA	NA
Youngstown Sheet & Tube Co.	5,520,000	4,947,500	5,091,876	3,937,490	102.92 ^s	90.10 ^s	6.06
Armco Steel Corp.	4,902,000	4,718,000	4,704,773	4,042,473	95.98	85.86	7.21
Inland Steel Co.	4,500,000	3,906,233	4,515,076	3,307,253	100.29	84.66	7.50
Colorado Fuel & Iron Corp. ⁴	2,311,785	2,024,000	2,130,451	1,892,485	92.16	93.50	3.77
Wheeling Steel Corp.	1,860,000	1,860,000	1,797,419	1,464,985	96.64	78.76	6.93
Sharon Steel Corp.	1,550,000	1,550,000	1,527,706	1,284,170	98.56	82.85	4.39
Kaiser Steel Corp. ⁴	1,536,000	1,380,000	1,458,904	1,381,862	100.06 ^s	100.13 ^s	6.25
Pittsburgh Steel Co.	1,404,000	1,152,000	1,037,335	971,029	86.44 ^s	84.29 ^s	4.48
Crucible Steel Co. of America	1,351,400	1,350,700	NA	NA	NA	NA	NA
Granite City Steel Co.	932,000	720,000	937,801	621,574	100.62	86.33	6.92
Barium Steel Corp.	893,000	893,000	497,790	690,128	55.74	77.28	13
Allegheny Ludlum Steel Corp.	864,200	889,200	680,619	569,921	78.76	64.09	11.45
Northwestern Steel & Wire Co. ⁵ ..	825,000	825,000	440,503	313,857	53.39	38.04	.69
Newport Steel Corp. ⁶	708,537	708,537	528,024	399,666	74.52	56.41	6.07
Lukens Steel Co. ⁷	675,000	675,000	763,879	555,102	113.17	82.24	4.72
Detroit Steel Corp.	660,000	660,000	529,044	529,432	80.16	80.22	9.89
Alan Wood Steel Co.	625,000	625,000	598,334	658,449	95.73	105.35	5.37
Copperweld Steel Co.	618,380 ¹⁵	618,380 ¹⁵	16	16	16	16	16
McLouth Steel Corp.	579,700	579,700	528,733	491,756	91.21	84.83	9.91
Laclede Steel Co.	440,000	410,000	427,514	413,292	97.16	100.80	6.32
Rotary Electric Steel Co.	425,000	425,000	299,776	323,959	70.54	76.23	7.55
Keystone Steel & Wire Co.	425,000	425,000	556,969	389,762	83.99	91.71	11.63
Continental Steel Corp.	394,000	394,000	362,048	325,138	91.89	82.52	4.43
Midvale Co.	353,373	324,947	79,131	99,967	22.39	30.76	17.16
Carpenter Steel Co. ⁴	76,731	73,474	73,503	72,379	95.79	98.51	43.97
Vanadium-Alloys Steel Co. ⁴	42,000	19,000	13,716	15,208	32.66	80.04	79.94
Total (or average)	112,865,606	106,614,671	98,534,065	81,004,917	93.62	81.37	\$6.48

	Number of Shares of Common Stock Outstanding		Common Stock Valuation		Preferred Stock Valuation	
	1953	1952	1953	1952	1953	1952
United States Steel Corp.	26,109,756	26,109,756	\$870,325,200	\$870,325,200	\$360,281,100	\$360,281,100
Bethlehem Steel Corp.	9,582,942	9,582,942	303,459,830	303,459,830	93,388,700	93,388,700
Republic Steel Corp.	5,952,919	5,902,719	137,024,601	136,060,726	28,204,300	28,204,300
Jones & Laughlin Steel Corp.	6,200,654	6,200,654	62,007,000	62,007,000	29,357,000	29,357,000
National Steel Corp.	7,362,045	7,362,045	73,620,450	73,620,450	None	None
Youngstown Sheet & Tube Co.	3,350,016	3,350,016	105,088,053	105,088,053	None	None
Armco Steel Corp.	5,214,989	5,214,994	52,149,886	52,149,936	None	None
Inland Steel Co.	4,907,654	4,899,380	62,852,323	62,502,746	None	None
Colorado Fuel & Iron Corp. ⁴	2,478,084	2,158,084	12,391,021	10,791,021	12,043,396	2,378,084
Wheeling Steel Corp.	1,423,897	1,423,897	37,021,322	37,021,322	35,752,600	35,752,600
Sharon Steel Corp.	1,100,000	1,100,000	11,060,390	11,060,390	None	None
Kaiser Steel Corp. ⁴	3,200,000	3,200,000	3,200,000	3,200,000	40,000,000	40,000,000
Pittsburgh Steel Co.	1,281,208	1,182,651	12,847,236	11,017,188	24,194,300	24,194,300
Crucible Steel Co. of America	687,180	634,985	17,179,514	15,874,644	29,436,700	29,436,700
Granite City Steel Co.	1,544,044	1,376,477	19,398,588	17,238,068	12,135,900	12,135,900
Barium Steel Corp.	2,299,859	2,259,857	2,299,859	2,259,857	None	None
Allegheny Ludlum Steel Corp.	1,689,358	1,656,233	1,689,358	11,245,174	8,134,600	8,134,600
Northwestern Steel & Wire Co. ⁵ ..	817,825	817,825	4,089,125	4,089,125	None	None
Newport Steel Corp. ⁶	1,078,546	1,078,547	1,078,546	1,078,547	None	None
Lukens Steel Co. ⁷	317,976	317,976	3,179,760	3,179,760	None	None
Detroit Steel Corp.	2,419,017	2,371,586	2,419,017	2,371,586	None	None
Alan Wood Steel Co.	624,812	606,377	6,248,120	6,063,770	6,457,500	6,457,500
Copperweld Steel Co.	515,188	514,864	2,575,940	2,574,320	4,336,900	4,336,900
McLouth Steel Corp.	1,189,600	951,680	2,974,000	2,379,200	None	None
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None
Rotary Electric Steel Co.	348,350	290,413	3,483,500	2,904,130	None	None
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None
Continental Steel Corp.	501,361	501,361	7,018,789	7,018,789	None	None
Midvale Co.	600,000	600,000	10,574,621	10,574,621	None	None
Carpenter Steel Co. ⁴	427,125 ¹⁸	427,045 ¹⁸	2,135,625 ¹⁸	2,135,225 ¹⁸	None	None
Vanadium-Alloys Steel Co. ⁴	412,157	412,052	2,000,000	2,000,000	None	None
Total (or average)	95,717,812	94,585,666	\$1,838,120,841	\$1,838,019,845	\$683,722,996	\$674,672,996

Boldface type is used under those columns in which figures from
all 31 companies were not received. NA=Not Available.
*Denotes a credit. †Denotes a deficit.

¹ Excluding amount maturing within one year.
² After federal income taxes.
³ Including funded debt due within one year.



THIS SPECIAL REPORT is compiled from data from 31 producers representing 93.4 per cent of the steelmaking capacity in the United States

Surplus	1952	Total Capitalization	1952	Provision For Depreciation, Depletion	1952	Total Income Before Dividends and Interest on Bonds	1952	Total Income	Cent of Capitalization
1953	1953	1953	1953	1953	1953	1953	1953	1953	1953
1,240	\$905,511,345	\$2,319,132,239	\$2,197,124,774	\$236,555,029	\$176,918,467	\$224,220,307	\$145,549,814	9.67	6.1
1,056	522,795,196	1,163,636,586	1,217,957,726	73,737,870	54,483,282	144,209,686	98,662,545	12.39	7.1
1,721	276,432,402	620,878,235	606,379,873	41,046,221	25,756,204	61,833,984	48,765,540	9.96	6.1
1,000	263,580,000	492,373,000	499,596,000	25,341,000	21,411,000	36,206,000	23,412,000	7.35	6.1
1,920	256,876,254	418,230,307	385,035,319	30,324,536	21,607,143	52,093,332 ¹⁰	40,692,327	12.46	10.4
1,076	201,627,920	424,993,129	389,815,973	30,625,812	17,695,579	27,672,269	24,804,994	6.51	6.1
1,900	243,238,329	388,931,246	375,908,210	26,916,511	16,726,856	36,412,145	33,915,802	9.36	6.1
1,489	170,189,501	360,897,312	346,688,747	17,218,686	11,376,156	37,351,581	26,928,021	10.35	7.1
1,612	70,571,067	163,459,029	132,238,055	6,708,878	5,064,010	10,093,057	7,032,422	6.17	6.1
1,655	73,908,665	205,968,477	201,707,487	11,435,907	8,096,425	14,323,207	12,800,200	6.95	6.1
1,075	49,106,450	69,326,465	68,016,840	3,617,514	3,024,506	6,982,526	5,398,962	10.07	7.1
1,413	51,798,992	240,847,614	208,125,843	12,145,033	7,451,167	14,501,960	13,926,042	6.02	6.1
1,506	40,554,038	114,525,878	104,203,194	4,070,589	4,305,553	5,586,216	5,622,705	4.88	6.1
1,032	36,897,933	122,320,246	124,250,177	9,586,262	5,806,987	6,659,495	6,762,790	5.44	6.1
1,502	22,068,390	90,878,115	82,648,433	3,041,417	2,396,131	8,290,799	5,869,488	9.12	7.1
1,158	17,328,858	21,097,017	19,588,715	1,571,399	1,201,480	2,321,140	2,746,050	11.00	10.4
1,022	56,059,279	109,117,980	106,299,053	8,598,389	6,054,413	7,791,287	5,940,324	7.14	6.1
1,755	11,446,592	19,187,072	21,319,409	1,147,307	793,566	303,163	1,830,601	1.58	8.1
1,192	20,238,310	21,918,768	22,269,887	1,005,004	1,039,199	3,239,860	1,971,099	14.78	8.1
1,198	21,040,651	30,675,958	29,637,411	1,779,342	1,261,369	3,918,649	2,573,261	12.77	8.1
1,939	33,259,801	78,822,956	59,557,263	4,540,796	1,971,303	6,880,616	4,967,953	8.73	8.1
1,232	13,176,896	31,561,852	30,122,666	2,907,624	2,882,843	3,435,301	2,504,414	10.88	8.1
1,920	15,735,893	30,051,094	30,113,500	1,463,183	1,025,625	3,142,475	2,377,145	10.46	7.1
1,396	22,406,696	94,027,396	36,035,896	3,904,413	3,806,061	6,471,766	4,730,757	6.88	13.1
1,082	11,469,777	20,736,280	17,353,323	1,346,434	1,142,706	2,795,201	2,205,628	13.48	13.1
1,451	10,486,788	18,474,951	14,390,918	1,020,160	939,280	2,393,049	1,896,684	12.95	13.1
1,831	19,409,386	23,163,498	22,013,553	81,820	790,125	4,149,946	4,073,232	17.92	13.1
1,620	10,092,362	20,812,409	20,111,151	1,143,108	603,021	1,717,663	1,505,656	8.25	13.1
1,237	7,211,690	18,334,858	17,786,311	608,000	597,335	1,357,781	1,188,899	7.41	6.1
1,955	20,249,553	24,477,278	22,511,877	496,846	434,763	3,231,685	2,863,432	13.20	13.1
1,560	6,736,956	8,824,560	8,736,956	229,328	173,366	1,096,434	1,252,686	12.42	14.1
1,245	\$3,481,505,970	\$7,767,681,805	\$7,427,544,040	\$565,114,418	\$406,835,921	\$740,682,580	\$544,771,473	9.54	14.1

Dividends Per Share on Common	1952	Normal Federal Income Taxes	1952	Federal Excess Profits Tax	1952	Total Assets	1952	Current Assets	1952
1953	1953	1953	1953	1953	1953	1953	1953	1953	1953
\$3.00	\$3.00	\$270,000,000	\$132,000,000	\$53,000,000	\$15,000,000*	\$3,247,500,000	\$2,988,434,756	\$1,174,326,637	\$1,010,771,193
4.00	4.00	144,500,000	80,200,000	16,500,000	14,200,000*	1,782,955,774	1,610,078,107	978,971,938	851,193,422
4.50	4.00	80,300,000	42,900,000	20,200,000	300,000*	741,391,341	757,786,524	293,852,643	288,531,193
1.95	1.80	27,870,000	3,068,000	80,000	8,296,000*	885,242,000	838,944,000	186,855,000	168,855,000
3.25	3.00	60,225,000	41,350,000	9,100,000	650,000	527,811,538	496,578,152	213,857,733	218,785,000
3.75	3.00	27,900,000	20,380,000	None	3,490,000*	513,970,613	479,214,935	237,348,159	239,451,193
3.00	3.00	43,440,177	38,375,239	7,348,431	4,719,987	464,674,185	464,050,153	201,773,838	204,771,193
3.50	3.00	35,599,000	18,333,000	3,780,000	5,216,000*	432,854,511	400,814,562	211,199,422	193,671,193
1.50	1.50	12,239,900	7,598,800	2,332,500	862,700	215,354,493	176,157,962	100,804,287	69,611,193
3.00	3.00	13,275,000	9,611,000	761,000	2,136,000*	234,185,801	228,226,485	83,705,462	95,951,193
4.00	4.00	6,820,000	3,600,000	420,000	850,000*	86,027,074	85,451,794	52,635,143	52,811,193
.50	.25	9,700,000	9,900,000	None	None	266,529,540	237,002,354	70,558,231	62,811,193
11	11	3,263,000	4,997,000	None	560,000*	135,270,968	128,751,121	39,547,868	51,991,193
11	11	6,100,594	5,156,146	796,385	421,360	149,835,868	157,035,710	63,917,741	68,711,193
11	1.10 ¹¹	6,953,500	3,917,000	None	1,384,208*	119,268,547	101,697,110	33,783,406	34,261,193
.50	.50	2,994,840	5,086,295	855,000	1,480,000	46,870,541	50,202,097	24,708,881	30,301,193
2.00 ¹¹	2.00 ¹¹	10,320,000	4,520,000	1,350,000	1,620,000*	139,419,075	140,535,974	62,352,431	66,051,193
None	None	485,000	645,000	None	None	83,128,991	82,011,240	7,710,874	8,131,193
.50	.45	2,325,000	1,500,000	75,000	541,600*	26,519,060	31,417,526	14,624,125	16,701,193
3.00	4.00	6,965,000	3,288,361	2,360,000	342,804	46,340,814	44,626,667	27,714,668	28,901,193
.75	1.00	6,127,263	4,593,235	485,000	80,000	91,530,181	78,684,696	24,320,100	25,531,193
1.40	1.40	2,457,000	2,550,000	None	75,000*	40,214,495	39,100,083	15,783,021	15,041,193
2.00	2.00	3,040,000	2,367,500	80,000	6,000	38,058,423	41,954,821	20,565,398	25,421,193
None	None	8,740,000	7,145,000	2,820,000	2,455,000	111,340,205	52,040,503	28,324,299	29,401,193
5.20	4.50	4,075,000	2,657,000	900,000	107,000	24,948,945	23,265,215	14,403,343	13,211,193
3.00 ¹¹	3.00 ¹¹	3,799,000	2,401,000	1,125,000	440,000	20,350,013	17,639,959	7,706,753	7,631,193
1.60	1.60	4,387,555	5,156,219	474,072	960,429	27,599,753	26,734,205	13,017,198	12,211,193
1.40	1.70	1,700,000	1,880,000	17	17	24,238,582	23,490,734	10,868,828	11,401,193
1.35	1.25	1,647,000	2,218,000	None	None	23,449,723	23,593,061	15,631,528	16,241,193
3.00	3.00	5,884,820	5,334,346	2,038,539	1,746,557	37,654,974	35,583,115	23,688,922	25,901,193
2.45	2.60	1,547,000	2,039,000	513,000	700,000	13,171,959	14,533,925	8,626,311	11,241,193
.....	.....	\$814,680,649	\$474,767,141	\$127,343,927	\$38,696,971*	\$10,547,707,987	\$9,825,687,546	\$4,263,184,188	\$3,956,611,193

d by

¹⁰ Includes two classes of preferred stock.

¹¹ Stock dividends in common declared or paid.

¹² Includes scrip certificates.

¹³ Not applicable to company's operations.

¹⁴ Ingot capacity adjusted.

¹⁵ Represents ingot capacity of steel plant only.

Financial Analysis

OF THE STEEL INDUSTRY FOR 1953

Net Sales		Net Profit—Per Cent of Net Sales		Net Income Before Dividends		
1953	1952	1953	1952	1953	1952	
861,034,728	\$3,137,397,336	5.75	4.58	\$222,087,840	\$143,687,746	United States Steel Corp.
094,952,155	1,701,541,383	6.39	5.34	133,947,837	90,900,771	Bethlehem Steel Corp.
137,123,547	918,447,135	4.99	4.82	56,743,547	44,274,053	Republic Steel Corp.
624,337,000	495,401,000	4.97	3.93	31,015,000	19,482,000	Jones & Laughlin Steel Corp.
634,178,060	543,625,817	7.94	6.85	50,334,130 ⁹	37,559,477	National Steel Corp.
554,059,088	439,623,183	5.57	5.21	30,839,716	22,915,822	Youngstown Sheet & Tube Co.
588,919,900	518,575,218	5.76	6.04	33,902,462	31,337,861	Armco Steel Corp.
578,610,625	460,451,935	5.85	5.16	33,867,184	23,755,218	Inland Steel Co.
248,835,574	195,757,164	3.23	2.94	8,031,224	5,761,965	Colorado Fuel & Iron Corp. ⁴
219,509,774	180,285,277	5.68	6.07	12,458,311	10,950,780	Wheeling Steel Corp.
168,268,508	132,376,426	3.99	3.87	6,709,625	5,120,414	Sharon Steel Corp.
134,500,041	117,925,049	6.78	8.82	9,121,284	10,399,306	Kaiser Steel Corp. ⁴
141,471,302	130,158,219	3.29	3.96	4,648,195	5,150,034	Pittsburgh Steel Co.
232,276,000	180,266,000	2.20	2.99	5,109,802	5,394,520	Crucible Steel Co. of America
87,856,006	74,587,639	7.39	6.68	6,488,452	4,985,954	Granite City Steel Co.
89,719,175	99,052,028	2.59	2.77	2,321,140	2,746,050	Barium Steel Corp.
242,091,546	190,060,165	3.22	3.13	7,791,287	5,940,324	Allegheny Ludlum Steel Corp.
44,317,283	34,049,969	.68	5.38	303,163	1,830,601	Northwestern Steel & Wire Co. ⁵
63,989,993	50,502,854	5.01	3.77	3,205,698	1,903,209	Newport Steel Corp. ⁶
97,850,937	69,616,358	3.69	3.33	3,607,713	2,316,791	Lukens Steel Co. ⁷
93,391,509	87,421,483	5.60	4.89	5,230,259	4,276,666	Detroit Steel Corp.
59,756,645	60,479,849	5.38	3.72	3,213,690	2,251,073	Alan Wood Steel Co.
83,803,418	71,642,488	3.40	3.22	2,852,078	2,304,387	Copperweld Steel Co.
NA	NA	NA	NA	5,241,501	4,227,854	McLouth Steel Corp.
50,834,319	47,545,026	5.32	4.49	2,703,805	2,132,746	Laclede Steel Co.
44,150,335	37,212,183	5.12	4.95	2,262,367	1,843,064	Rotary Electric Steel Co.
44,554,153	48,939,590	9.31	8.32	4,149,946	4,073,232	Keystone Steel & Wire Co.
36,761,804	35,716,970	4.36	4.14	1,603,163	1,477,030	Continental Steel Corp.
30,255,784	30,039,172	4.49	3.96	1,357,781	1,188,899	Midvale Co.
53,936,056	47,680,029	5.99	6.01	3,231,685	2,863,432	Carpenter Steel Co. ⁴
15,649,717	17,284,383	7.01	7.25	1,096,434	1,252,686	Vanadium-Alloys Steel Co. ⁴
\$357,044,982	\$10,158,661,328	5.63	4.96	\$695,476,319	\$504,303,965	Total (or average)

Current Liabilities ³		Ratio of Current Assets to Current Liabilities		Working Capital		
1953	1952	1953	1952	1953	1952	
28,306,852	\$684,151,997	1.42—1	1.48—1	\$346,019,785	\$326,555,376	United States Steel Corp.
77,319,188	352,120,381	1.70—1	2.42—1	401,652,750	499,680,723	Bethlehem Steel Corp.
01,542,012	133,133,112	2.89—1	2.17—1	192,310,631	155,190,100	Republic Steel Corp.
34,168,000	75,345,000	2.22—1	2.24—1	102,687,000	93,461,000	Jones & Laughlin Steel Corp.
78,203,308	73,626,979	2.73—1	2.97—1	135,654,425	145,121,069	National Steel Corp.
77,983,998	68,667,688	3.04—1	3.49—1	159,364,161	170,787,553	Youngstown Sheet & Tube Co.
67,670,311	80,814,075	2.98—1	2.53—1	134,103,527	123,973,720	Armco Steel Corp.
65,588,410	45,261,977	3.22—1	4.28—1	145,611,012	148,395,529	Inland Steel Co.
43,954,317	38,047,053	2.29—1	1.83—1	56,849,970	31,514,332	Colorado Fuel & Iron Corp. ⁴
19,387,251	19,640,825	4.32—1	4.89—1	64,318,211	76,312,048	Wheeling Steel Corp.
16,290,609	16,924,954	3.23—1	3.12—1	36,344,534	35,916,807	Sharon Steel Corp.
25,681,926	28,876,511	2.75—1	2.18—1	44,876,305	33,966,961	Kaiser Steel Corp. ⁴
18,698,090	24,547,927	2.12—1	2.12—1	20,849,778	27,402,011	Pittsburgh Steel Co.
24,779,142	30,310,862	2.58—1	2.27—1	39,138,599	38,480,807	Crucible Steel Co. of America
20,387,999	16,002,597	1.66—1	2.15—1	13,395,407	18,324,121	Granite City Steel Co.
17,824,842	23,638,917	1.39—1	1.28—1	6,884,039	6,731,218	Barium Steel Corp.
27,751,240	31,899,208	2.25—1	2.07—1	34,601,191	34,137,050	Allegheny Ludlum Steel Corp.
12,071,919	9,961,831	.64—1	.82—1	4,361,045†	1,842,844‡	Northwestern Steel & Wire Co. ⁵
4,600,292	7,147,639	3.18—1	2.34—1	10,023,833	9,612,116	Newport Steel Corp. ⁶
15,637,725	14,901,873	1.77—1	1.94—1	12,076,943	14,014,895	Lukens Steel Co. ⁷
12,707,225	19,127,433	1.91—1	1.35—1	11,612,875	6,750,999	Detroit Steel Corp.
7,419,318	7,878,654	2.13—1	1.91—1	8,363,703	7,195,560	Alan Wood Steel Co.
7,746,670	11,430,798	2.65—1	2.22—1	12,818,728	13,971,993	Copperweld Steel Co.
17,212,809	16,004,607	1.65—1	1.84—1	11,111,490	13,484,584	McLouth Steel Corp.
3,887,215	5,611,892	3.71—1	2.36—1	10,516,128	7,631,733	Laclede Steel Co.
1,875,062	3,249,041	4.11—1	2.37—1	5,831,691	4,444,668	Rotary Electric Steel Co.
4,436,254	4,770,652	2.93—1	2.56—1	8,580,944	7,460,469	Keystone Steel & Wire Co.
2,669,175	2,613,659	4.07—1	4.37—1	8,199,653	8,806,739	Continental Steel Corp.
4,601,363	5,347,959	3.40—1	3.03—1	11,030,165	10,866,205	Midvale Co.
13,171,602	13,065,589	1.80—1	1.99—1	10,517,320	12,891,230	Carpenter Steel Co. ⁴
4,347,399	5,321,841	1.98—1	2.12—1	4,278,912	5,934,598	Vanadium-Alloys Steel Co. ⁴
\$107,921,523	\$1,869,443,531	1.93—1	2.12—1	\$2,055,262,665	\$2,087,173,370	Total (or average)

¹⁴ Comparisons would be misleading as company's operations include a wire and cable division with no steel ingot capacity.

¹⁵ Included within "Normal Federal Income Taxes" for year.

¹⁶ To be issued 123 shares with a valuation of \$615 in 1953, 203 shares with a valuation of \$1,015 in 1952.



Often it pays to relocate your facilities, but . . .

Move Cautiously on Plant Moves

That cornfield may not be the paradise you thought for a plant site. Industrial development group hears how automation, other factors are changing plant relocation ideas

LOOK BEFORE YOU LEAP if you're thinking of moving your plant or starting a new facility.

That's the advice of industrial real estate and other experts. They spoke before the American Industrial Development Council in Washington when it held its annual conference.

foresight Needed—"We have not been as critical in locating plants as we should have been," says James R. Allan, International Harvester Co., Chicago. "We would put a plant in a cornfield in open country and then in a few years be blamed by residential developments and be faced with other problems. We have learned the hard way that it is necessary to take all factors into account to avoid such difficulties."

The most important factor in selecting a plant location is the need for buffer areas around the plant, Mr. Allan believes. That is to provide space for future expansion and parking facilities and to prevent noise and air pollution from becoming a nuisance.

Water Freight—"In examining the transportation angle, it is wise to make sure of the availability of water transportation—since water freights may prove to be one of the

last of the controllable elements in costs," says Mr. Allan.

Before you decide to move your plant to a new location as a remedy to a declining-profits operation, don't just look at the external factors in your business. Look at the internal factors as well, advises John O. Tomb, McKinsey & Co., Chicago, management consultants. He cites cases where early plans to move were abandoned after internal examination revealed the declining profit trouble was due to managerial deficiencies.

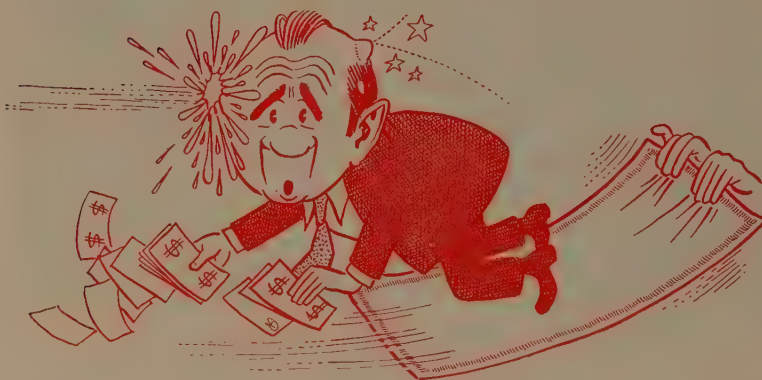
Mr. Tomb warns industry that it loses every time a plant moves out of its area—so that such a removal becomes everybody's business. "Every time you let a plant move out, your community recedes, your power costs tend to go up, the supply of skilled labor tends to diminish, and there is a decline in services."

Automation's Impact — The recent sharp stimulus to the development of automation by industry thrusts some new considerations into the problem of plant location, says Dr. David G. Osborn, University of Chicago professor, who handles warehouse planning and location for Kroger Co., Cincinnati.

"Automation increases output per employee and reduces the plant space requirement. The average space reduction is around 50 per cent. Machinery required for automation is expensive, so that instead of buying new machinery for expansion as demand for the product increases, there should be a trend toward round-the-clock operation of this expensive machinery. Furthermore, automation brings a reduction in the number of production employees and an increase in the number of maintenance men. Proximity to quick instrument repair facilities is another factor, often making the urban location the most desirable.

Honesty Pays—If you deal with reputable plant locators and real estate men, premature word of your plans will not get out to the public, says Harry P. Richter, manager, Real Estate Division, United States Steel Corp. Many people knew all about the Fairless plant and had a hand in working it out, but none of them ever "leaked."

Mr. Richter cautions that the free rent and tax remission which is offered by so many communities to attract new industries should not be a factor in causing a company to select a location. You just don't get something for nothing, he says. A location always should be selected in the light of all the facts. Advantages such as a good location or favorable freight rates may far outweigh free rent, tax remission and other benefits.



So You Want To Invest Abroad— U.S. Study Shows the Problems

AN AMERICAN manufacturer of pumps and other equipment used in the operation of irrigating systems obtained a contract from the government of India.

After 3½ years so little headway had been made because of Indian government intervention that the firm asked for a new contract. It got it, but under even more onerous terms than the first one. The company would have preferred to back out altogether, but by this time it had a tiger by the tail because it had already sunk too much money into the deal to drop out.

Candor from Commerce . . .

That story isn't unusual, but it is unusual to be found where it is—in a Department of Commerce report in response to a congressional demand for a survey to show the nature and magnitude of impediments to private U. S. foreign investment. "Factors Limiting U. S. Investment Abroad" is a surprisingly candid appraisal of the irritations that bedevil Americans attempting to do business abroad. It could serve as a supplement to the Randall Commission's proposals for the nation's trade policies.

Philippine Boomerang . . .

The book tells the factors adverse to U. S. private investors in some 30 countries in the Americas, Western Europe, the Near East and Africa and the Far East and Australasia. The main problem is that all those nations want American capital for their economic development—but on their own terms.

Those terms in the case of the manufacturer in India required that at the end of five years only 1 or 2 per cent of the operating personnel could be non-Indians. In addition there was a limitation on the export of profits.

Even the Philippine Republic, which badly needs American capital, has adopted a policy that may paralyze foreign investments. Filipinos decreed that companies financed from abroad can not pay any more in dividends than they had paid in 1948. On the surface, that appears not unreasonable, but the joker is that in 1948 many American companies were pouring money into the islands and taking little out in dividends.

As a result, quotations on Philippine enterprises have been going down on American exchanges, and

the flow of new American money to the Philippines has slowed to a trickle.

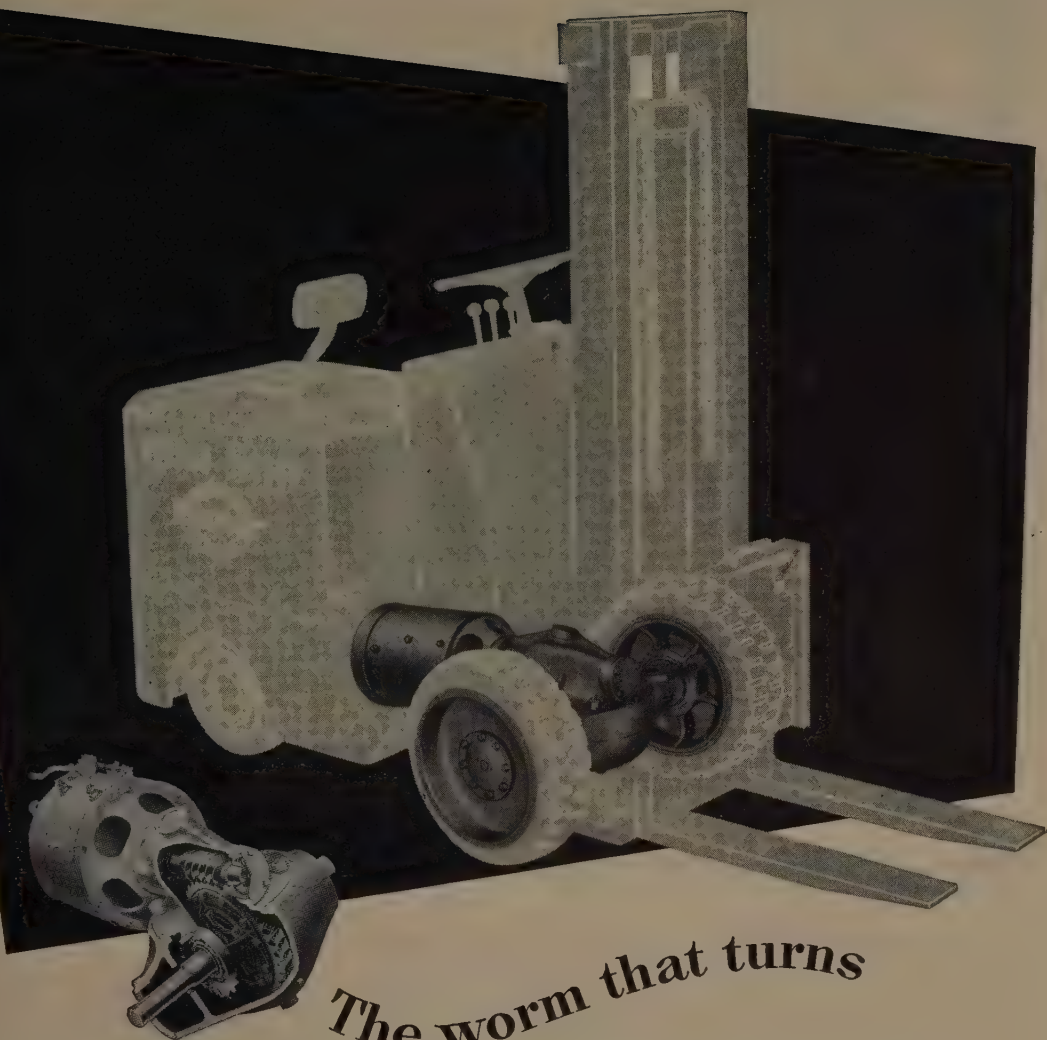
How To Win Friends Abroad . . .

An interesting fact disclosed by the book is that not all United States investors fare alike in the same country. In a country where one American firm got a favorable deal, other American enterprises flourish and enjoy fine co-operation. To a considerable extent this depends on the line of business involved; many countries which place high barriers in the path of enterprises that are devoted to luxury products give favorable treatment to those that will advance the country's primary economic needs. And some firms, which make a practice of cutting well selected nationals of the country into their business and into their profits, get along famously.

Primers for Investors . . .

Although this study is designed to inform legislators of problems facing private U. S. investors, it may be even more helpful to you if you're planning investments abroad. True, this report may help our government proceed more effectively in obtaining remedial action from the countries involved, but the study indicates that a part of an investor's success depends on his own individual know-how. Here's a book that will help you improve that know-how.

It can be obtained for 55 cents from the Superintendent of Documents, Government Printing Office, Washington 25. It's the first of a trilogy. Part 2, now in preparation, is to be entitled "Balancing Factors Affecting the Level of U. S. Investment Abroad." It will deal with specific government regulations, balance of payment problems, limitations on export of earnings, etc. The third book, also in preparation, will be especially interesting in showing how typical American foreign investors fare. It will be a resume of experience of some 300 American companies who have made foreign investments with varying fortune.



The worm that turns ...with ever-increasing efficiency

Baker Industrial Trucks use worm gearing in their drive axles, and here's why:

Industrial truck drive systems are called on for punishing, heavy-duty service. Truck operation is comparable to driving an overloaded auto constantly in low gear. Industrial truck transmissions change speed or direction as often as 1800 times during an eight-hour day.

The necessary gear reduction from motor shaft to drive wheels can be accomplished in several ways. The two most common are a gear train of two or more steps with spur or bevel gears, or single-step worm gearing.

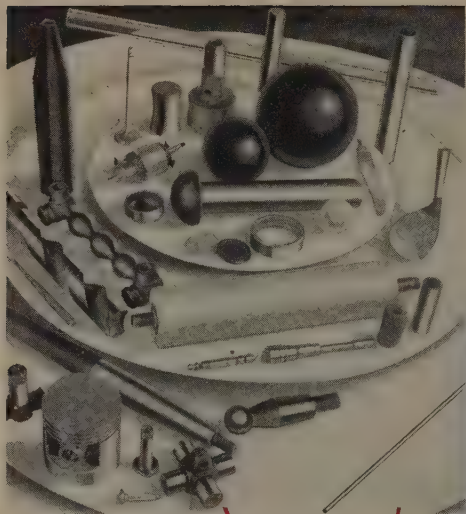
The first means more moving parts, more maintenance, and compounded friction losses for each successive step-down. Development of the highly

efficient involute worms, new lubricants and new tooth profiles, on the other hand, produce worm gearing efficiencies up to 92%—with fewer components.

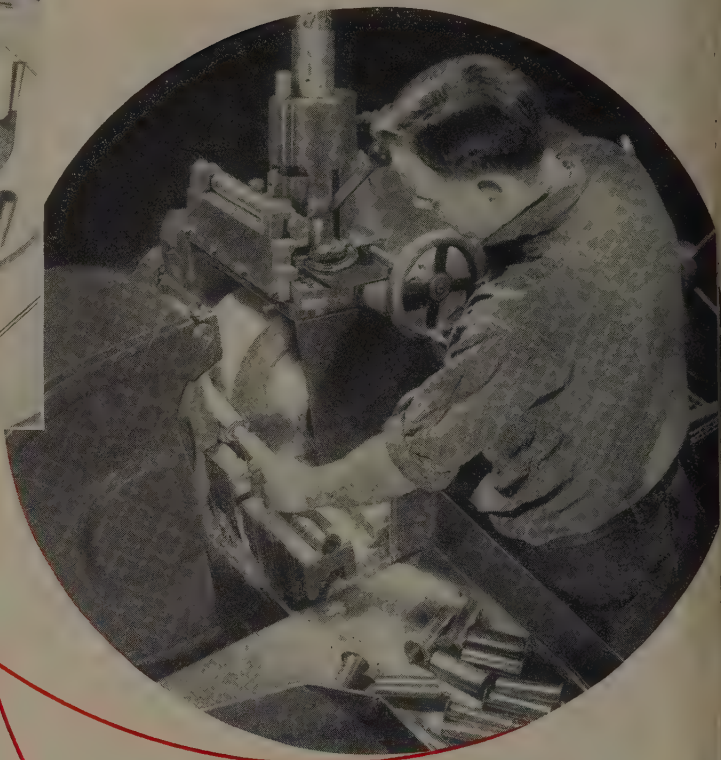
One more point: Worm gearing actually increases efficiency with wear since the worm continuously regenerates the "ideal" tooth profile on the worm wheel. In spur or bevel gearing, efficiency declines progressively as teeth wear and lost motion develops.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book—Bulletin 64. The BAKER-RAULANG Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker
industrial trucks



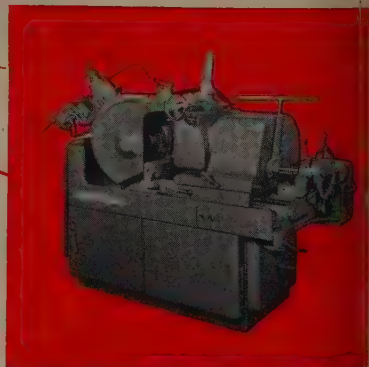
Above: These widely differing parts were all finished economically by centerless grinding. Materials include iron, steel, stainless steel, brass, aluminum, plastic.



Below: Close-up of a CINCINNATI FILMATIC No. 2 Centerless Grinder set up for a typical infeed job. The Hydraulic Profile Truing equipment over the regulating wheel is especially desirable on machines used for small lot production.

Why not take advantage of the Centerless Method FOR GRINDING SMALL QUANTITIES?

Nearly everyone knows about the advantages of centerless grinding large quantities of parts on a CINCINNATI FILMATIC No. 2 . . . the uniformly high quality of performance . . . simplicity and ease of operation . . . low cost of production. But not many know that these advantages can also be realized for wide varieties and *small quantities* of parts assigned to a CINCINNATI. How can it be done? There are two main considerations: 1) Group together all parts requiring a particular type of setup. You will eliminate frequent changes from thrufeed to infeed jobs. 2) Group all parts together by diameter. It takes less time to change the setup for a small difference in diameter than a large difference. It will certainly be to your advantage to investigate CINCINNATI FILMATIC No. 2 Centerless Grinders for a wide range and small quantities of parts. A more complete story of economical small parts production may be obtained by writing for "Principles of Centerless Grinding," publication No. G-503-2.



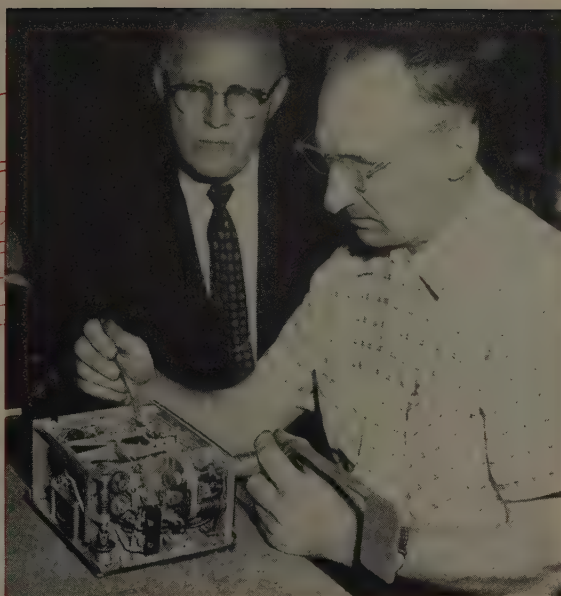
CINCINNATI FILMATIC No. 2 Centerless Grinder. Catalog No. G-611-1 contains complete specifications. Copy sent on request.

CINCINNATI GRINDERS INCORPORATED
(Subsidiary of The Cincinnati Milling Machine Co.)
CINCINNATI 9, OHIO



CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES



Rockwell Mfg. Co.

Taximeters: Accountants on Wheels

Some nine makers are turning out about 5000 units a year. Of the nation's 100,000 cabs, 60,000 use the device. Manufacturers seek to broaden markets

PRECISION INSTRUMENT for rough service, taximeters are picking off improving sales figures for producers. The business outlook is better yet, say most of the nine manufacturers.

More cities are specifying meters for their taxicabs, as they realize advantages of precision calculation over the zone method of determining fares," remarks Ralph R. Ulrich, vice president, sales, of Rockwell Mfg. Co.'s Register Division. That Pittsburgh company produces the Ohmer taximeter.

Postwar Sales—"Best years for taximeter production followed World War II, when many small taxicab companies were formed," says officials of U. S. Taximeter Co., New York. Sales now are estimated at about 5000 meters annually.

With taximeters built to give 25 years of dependable operation under extreme traffic conditions, producers concentrate on developing new markets, rather than de-

pending on replacement. And most producers, like Viking Tool & Machine Corp., Belleville, N. J., have several other product lines.

Sales Prospects — "Roughly 40 per cent of all taxicabs do not use meters to compute fares," reports L. Mandler, vice president, Pittsburgh Taximeter Co., Pittsburgh. Taximeter sales managers are aiming at that potential market among the 100,000 taxicabs now in operation.

That meter relentlessly computing your taxi fare is a durable, precise combination of 225 to 600 parts, manufacturers say. Price averages about \$280. "The taximeter combines operations of a clock, calculating machine and speedometer," says Mr. Mandler. The clock records waiting time while the calculating machine computes your fare.

Easy To Assemble—Assembly of meters is simplified for economy and interchangeability of parts. Most specifications are determined

by local ordinances. "Any functional part of the Ohmer meter can be removed by the operator and replaced in the field without removing side frames," Mr. Ulrich says.

For maximum meter life and protection against manipulation, the selection of metals used in taximeters is extremely important. Gears may be made of bronze or hardened steel, according to the application. Providing maximum resistance to wear, bearings in frames and base of the meter are bronze. Hardened steel in cams and levers can furnish rigidity needed for accurate and permanent adjustment with long life.

Use of Aluminum — "In the Ohmer meter, mounting shafts must be strong enough to resist distortion, insuring functional freedom of working parts after installation," Mr. Ulrich reports. "All precision parts are mounted between heat treated aluminum frames and set on a rigid tempered aluminum base."

Guarantees against tampering are built into each mechanism. Counters are covered with hardened steel or insulated glass for this purpose. A welded steel cabinet then covers the mechanism. Meters are sealed so they can't be changed without knowledge of a city inspector.

Long Life—Combination of durability and accuracy brings dependable performance in the taximeter. "Meters will perform accurately for at least ten years with minimum maintenance and under hard usage," says Mr. Ulrich. "The average cab makes 45 pay trips a day and travels 180 miles. The taximeter is working during about 35,000 of the 65,000 miles driven each year. Thousands of Ohmer meters are in use today which are over 25 years old."

Renegotiation Deadline Extended

The Renegotiation Board has extended until further notice the time for contractors having a fiscal year ending in 1954 to file required financial statements. Notice of the extended date will be given after Congress has completed legislation amending and extending the Renegotiation Act.

Make it **WEIGH LESS ...**

and **LAST LONGER**

with



You can design light weight, longer life, and economy into your products by including N-A-X HIGH-TENSILE in your plans.

It is 50% stronger than mild steel.

It is considerably more resistant to corrosion.

It has greater paint adhesion with less undercoat corrosion.

It has high fatigue life with great toughness.

It has greater resistance to abrasion or wear.

It is readily and easily welded by any process.

It polishes to a high lustre at minimum cost.

And with all these physical advantages over mild carbon steel—it can be cold formed as readily into the most difficult shaped stamping.

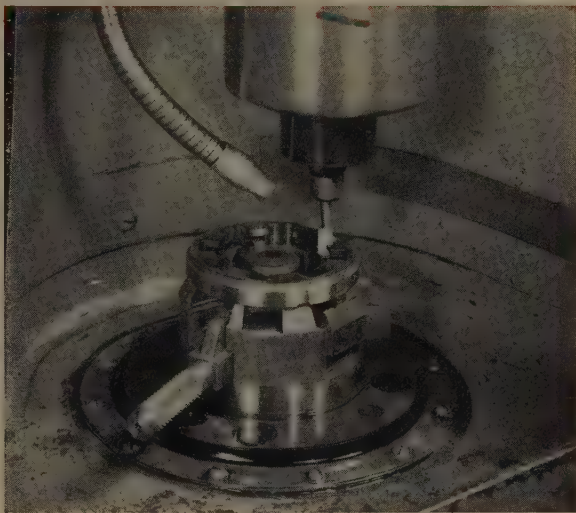
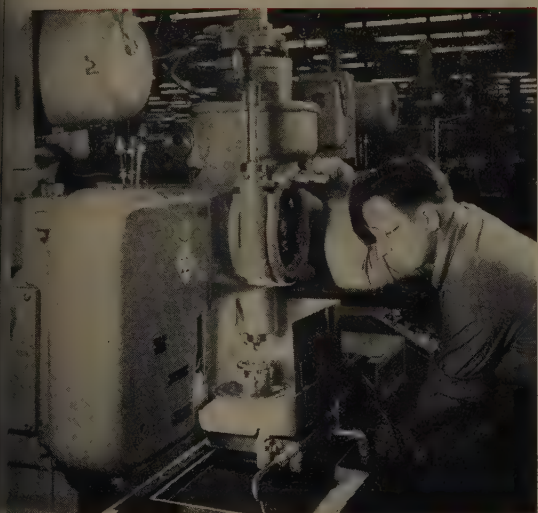
Sound like something for you? Ask for full facts and think of N-A-X HIGH-TENSILE when you re-design.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan





Imagination, air turbines and Fellows grinders team up to demonstrate . . .

How Engineering-Production Teamwork Pays at Chevrolet

DETROIT

ENGINEERS and production men additionally look upon one another with a degree of respect approach pure pity.

Because of auto company volume, there are no small mistakes and no small savings. Only a penny saved is about \$15,000 earned. And with incessant model changes and product development projects, the "make it"—"it can't be made" relationship must metamorphose to co-operation.

How Chevy Does It—It's no secret in the auto industry that you've got to go some to out-click Chevrolet. Yet by virtue of its size and volume, Chevrolet has the biggest co-ordination hurdle of all. That's why those attending the SAE meeting in Chicago recently were particularly interested in the paper by Edward N. Cole and Edward H. Kelly on "The Engineering and Production Team."

To begin at the beginning, final approval for a new major program cannot be obtained from management "before or later" than 21

months before the start of production. This gives management a chance to observe competitive trends and forecast the new model requirements more accurately. But once approval has been given, building of experimental models, testing, production design, production tooling, design check and purchasing of material are all done concurrently.

Expect the Unexpected—This program would be merely excruciatingly complex if everything went according to plan, but it never does. The experimental models usually show up with bugs in the design which must be corrected. After the designs are studied by production, it is often found that the design can be made more easily or economically if changes are made.

Enter the production engineer who probably was originally a design engineer that stopped to listen to what a production man had to say or vice versa. Chevrolet has several hundred people in its production engineering department

who have the responsibility of adapting designs for production requirements and integrating engineering and production activities.

The Beginning—Actually, the duties of the production engineer begin before the design has been released. In the first stages of design, he consults the production people on a number of matters which affect the utility of the design such as tooling. Before the design engineer devotes too much time to the design he must know how much tooling it will require, how much it will cost and how soon it can be obtained.

Not only can tool costs be cut by minor changes in design quite frequently, but the purchase of new machines may be obviated. Forging may seem the most economical way of producing a given design, for example, but if the forging shops are loaded with jobs new facilities would have to be purchased. Rather than do that, production might suggest that design be changed to a stamping when it has idle stamping capacity.

What To Look for—Other things the production engineer looks for in his investigation of the prints are dimensional tolerances too close to be held on production machines, tolerances too broad to insure a satisfactory field product,

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or specified assembly and gaging methods which should be changed to insure a better product and effect economies. Another of his concerns is to see that a proper selection of materials has been made.

If his investigation should uncover the need for a change, the production engineer has full authority to issue a change notice as long as the design or function is not vitally affected. Changes are verified by tests and production engineering has extensive testing facilities and is building more at Chevrolet. This helps provide answers to the questions: "Can it be made better?" "Can it be made easier?" "Can it be made at lower cost?"

Case Study—An interesting example of accomplishments of this group involves a design which engineering had no idea how to produce. The "impossible" part was an overrunning clutch cam surface which engineering asked production to finish to within 0.0002 inch of parallel. Engineering realized this was an unreasonable request because no tool manufacturer would build a machine which could finish the surface closer than 0.0015 inch of parallel. On the other hand, the tolerance was critical to the good operation of the Powerglide transmission.

The master mechanic set about creating a machine which would do the job. The rest of the industry was using a broach to finish the cam surface since the cam presented only limited access. Grinding was an alternative, but there was only room for a 5/16-inch grinding wheel. To drive that wheel at the required surface speed, tremendous velocities were needed.

Solution — The problem was solved. A Fellows grinder was obtained. For the regular drive, which was much too slow, an air turbine was substituted which drove the wheel at 65,000 rpm. The design was then refined until a machine was produced which would stroke, index and describe the curve on the cam surfaces all automatically. And as a final touch, an automatic device to dress the grinding wheel was added. Today 25 such machines are in use, essentially the same as the proto-

Auto, Truck Output

U. S. and Canada

	1954	1953
January . . .	594,789	614,000
February . . .	573,821	628,017
March . . .		752,474
April . . .		782,453
May . . .		685,390
June . . .		713,206
July . . .		757,595
August . . .		641,152
September . . .		605,228
October . . .		651,153
November . . .		457,852
December . . .		529,588
Total . . .		7,818,108

Week Ended	1954	1953
Mar. 6 . . .	139,263	158,825
Mar. 13 . . .	143,478	165,762
Mar. 20 . . .	154,895	169,923
Mar. 27 . . .	149,562	181,749
Apr. 3 . . .	143,299	170,567
Apr. 10 . . .	147,000*	176,782

Source: Ward's Automotive Reports.
*Estimated by STEEL.

type developed through engineering-production co-operation.

Another area which gets a great deal of production engineering attention is the assembly plant. If sufficient time and effort are given when new parts are designed, they can be put together better and more economically. The point is not whether two parts will go together, but how quickly they can be put together properly. Similarly, more attention is being given to standardization of parts and the elimination of unnecessary parts.

Co-operation — This information can only be gained by an engineer who knows what goes on within an assembly plant by actually spending time with their problems. While it is true that design sets up minimum basic costs beyond which only minor savings are possible, it is also true that production can determine the mode of design.

Thus it is that the buffer boys, the production engineers, contribute so much to the production of good design at the lowest cost.

Car of the Week

First "car of the week" for 1954 is the Plymouth.

The problem is that the Plymouth is still low horsepower of

a different color. With Hy-Dra, stepping on the accelerator is like shoving your foot into a bucket of yoghurt. With Power-Flite, Plymouth moves up into the creamed cheese class but only at room temperature. It'll take the Dodge treatment to cure Plymouth traffic light brushoff, and reportedly Plymouth will be getting a scaled-down Dodge engine to do just that.

Perhaps the most outstanding thing about the Plymouth on the road is its superb ride. This like color carnival rides like a heavyweight and probably offers more in that department than anything in its field. Concomitant with its ride, however, is a rather unusual cornering sensation until you get used to it. When you enter the corner, the car assumes a rather pronounced lean indicating the worst is yet to come. But nothing comes. Having satisfied its centrifugal impulses, the car undresses its way on around the bend in acceptable shape.

Retained from last year are the intelligently sensitive steering ratio and short turning radius which make the car extremely maneuverable.

Also retained are the centrally positioned glove compartment and good visibility which marked last year's models, together with an uncluttered dash to minimize damage to small heads in sudden stops. In one of those moves difficult to fathom, the one small ash tray next to the steering post where it was inconvenient to the passenger has been moved this year. Now it's on the right side convenient to the passenger and inconvenient to the driver.

But be that as it may, the continued high use of Plymouths in rugged taxi service bears much testimony that you'll shop a lot while before you find a more rugged and economical transportation piece.

Exhaust Notes

A removable plastic top for the Chevrolet Corvette will shortly be offered comparable to the unit that is available for the Thunderbird. In effect it will give the car the appearance of a hard-top and can be removed in summer.

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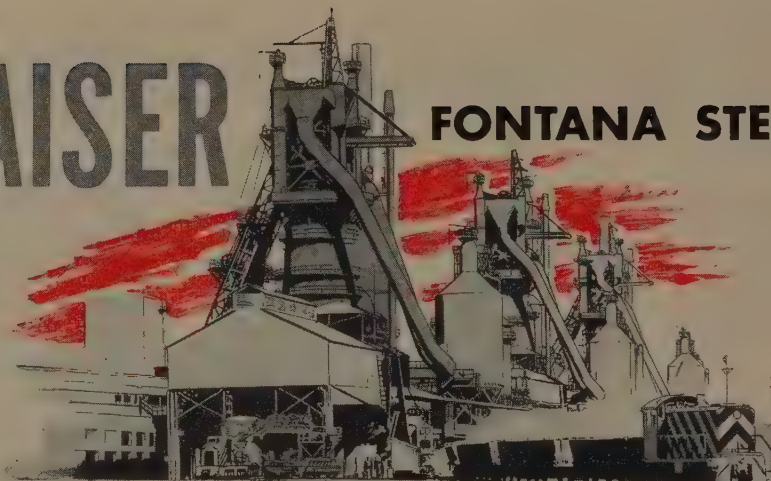


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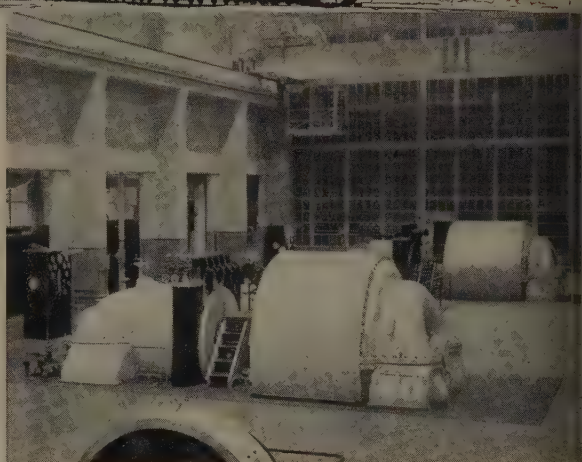
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FOUR COMPLETE I-R BLOWER PLANTS*

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350,000 cubic feet
of charging air per minute



**Ingersoll-Rand Turbo-Blowers
driven by I-R Steam Turbines and served by I-R Surface Condensers,
Air Ejectors and Condensate Pumps*

It takes a lot of air to keep the blast furnaces burning at the huge Kaiser plant. And *all of it* is supplied by Ingersoll-Rand Turbo-Blowers.

The I-R blower equipment at the Fontana Plant includes two 100,000 cfm and two 75,000 cfm steam turbine driven Turbo-Blowers, each served by I-R rectangular surface condensers, steam-jet air ejectors and condensate pumps. These complete I-R Blower Plants, with all elements designed to work together as a unit, provide the *maximum dependability* for continuous heavy-duty service, year after year.

When it comes to blast furnace blowing, Ingersoll-Rand's experience is unequalled. That's why I-R blast furnace turbo-blowers are first choice in America's steel plants. Your nearest Ingersoll-Rand engineer will be glad to tell you more about I-R turbo-blowers. Ask for your copy of catalog 8258.



Two of the four Ingersoll-Rand Turbo-Blowers installed in the furnace blowing room of the Kaiser Fontana Steel Plant.

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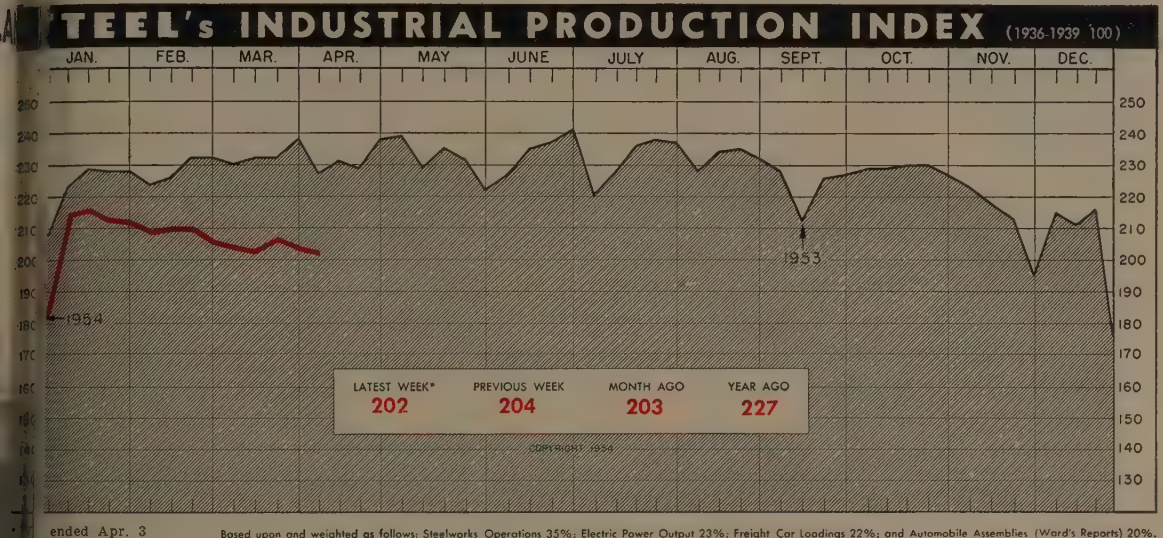
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Production Index Follows March Pattern

INDUSTRIAL PRODUCTION for April, as measured by STEEL's index, is getting off to the same start as it did in March, and businessmen are hoping that is the end of the similarity between the two months. Industrially, March came in like a lamb and left without the least sign of turning into a roaring lion. But to date there still is no definite sign of a return, and the leveling-off pattern set in March could be repeated in April.

The index for the week ended April 3 registered 202 per cent of the 1936-1939 average, just 1 percentage point below the level of a month ago. The decline of 2 percentage points from the previous week's reading is laid at the feet of the auto industry, which, strangely enough, is one of the most dynamic segments of industry at the present time. Production of 135,407 cars and trucks for the week ended April 3 was about 4000 units below the previous week, says *Ward's Automotive Reports*. While other segments worry about when orders and sales are going to turn up, the automakers bolt ahead with heavy production schedules in anticipa-

tion of sales which are "just around the corner."

Close Race for Third . . .

The pattern within the auto industry has taken some interesting turns so far this year. The past has been noted for the consistent ranking of Chevrolet, Ford and Plymouth, in that order, in both production and sales. But for first quarter, 1954, it appears that Ford has taken over No. 1 spot and Buick, a premium-priced car, has ousted Plymouth from No. 3 position in production. Sales figures so far are inconclusive, but Buick officials claim third position there, too. This may be indicative of the changing trend in the consumers' buying habits toward more higher-priced automobiles. It certainly has had its influence on the lower-priced auto manufacturers, because they continue to push their higher-priced models.

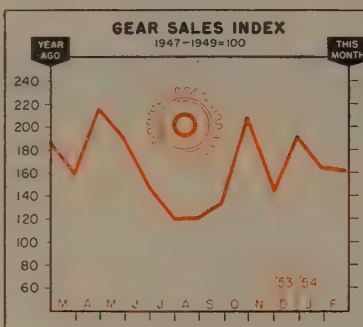
One of the big reasons total production in the automotive industry is lagging behind last year's figures can be found in trucks. While passenger cars are down only 8 per cent, trucks are off 17 per cent. The January-March pace of trucks

was the slowest since 1946, *Ward's* says. The 300,000th truck of 1954 rolled off the assembly line on April 6. A year ago the date for that event was Mar. 23.

Up-again, Down-again Steel . . .

Helping to offset somewhat the effect of the auto decline, steel operations made a slight comeback to 69 per cent of capacity during the week ended April 4. However, the American Iron & Steel Institute estimated production for the week ended April 11 would slip again to about 68 per cent of capacity. That would be 1,626,000 net tons of ingots and steel for castings.

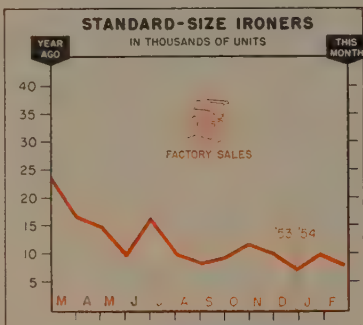
On the West Coast, Bethlehem Pacific Coast Steel Corp. gives an indication that business may be getting better. Incoming orders have increased each month since the beginning of the year, H. H. Fuller, president, says. The company's March shipments were at the highest level since last October. He explains that his company's operating rate dropped off last fall before the decline started in eastern mills. If the pattern holds, it may mean a pickup in



Gear Sales Index
(1947-1949=100)

	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	188.1	539.5*
Mar.	158.9	158.9	517.1*
Apr.	217.1	217.1	478.7*
May	189.8	189.8	425.9*
June	146.5	146.5	452.3*
July	120.7	120.7	145.3
Aug.	121.6	121.6	132.3
Sept.	135.6	135.6	143.4
Oct.	211.1	211.1	160.8
Nov.	144.9	144.9	150.9
Dec.	194.0	194.0	140.9

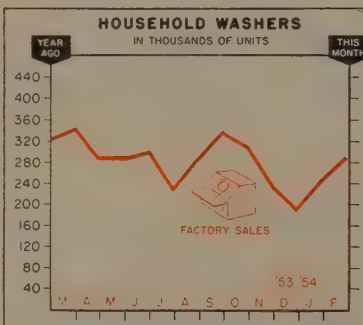
*(1935-1939=100)
American Gear Manufacturers Assn.



Standard-Size Ironers
Factory Sales—Units

	1954	1953	1952
Jan.	9,792	24,395	15,636
Feb.	8,208	22,586	17,630
Mar.	16,066	16,066	13,913
Apr.	14,080	14,080	8,938
May	9,323	9,323	12,652
June	12,529	12,529	17,654
July	9,626	9,626	15,025
Aug.	8,067	8,067	16,477
Sept.	9,113	9,113	22,492
Oct.	11,666	11,666	25,204
Nov.	10,105	10,105	19,724
Dec.	6,908	6,908	16,798

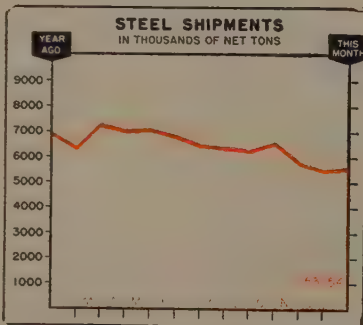
Total .. 154,464 202,143
American Home Laundry Mfrs. Assn.



Household Washers
Sales Billed—Units

	1954	1953	1952
Jan.	249,956	277,309	213,998
Feb.	295,171	326,604	255,864
Mar.	345,989	345,989	248,431
Apr.	288,474	288,474	217,211
May	286,515	286,515	213,668
June	304,086	304,086	274,457
July	228,268	228,268	207,593
Aug.	291,260	291,260	254,557
Sept.	340,532	340,532	233,732
Oct.	310,867	310,867	327,814
Nov.	238,153	238,153	293,079
Dec.	191,570	191,570	310,661

Totals ... 3,429,627 3,101,045
American Home Laundry Mfrs. Assn.



Steel Shipments
Net Tons

	1954	1953	1952
Jan. ..	5,727,600	7,067,636	6,589,193
Feb. ..	6,533,227	6,533,227	6,358,293
Mar. ..	7,436,919	7,436,919	6,890,391
Apr.	7,162,460	7,162,460	5,922,173
May	7,208,396	7,208,396	5,947,450
June	6,950,059	6,950,059	1,250,243
July	6,582,613	6,582,613	1,413,672
Aug.	6,498,605	6,498,605	6,312,118
Sept.	6,400,757	6,400,757	6,542,147
Oct.	6,726,850	6,726,850	7,155,611
Nov.	5,903,980	5,903,980	6,647,725
Dec.	5,684,920	5,684,920	7,105,382

American Iron & Steel Institute.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 22	Gray Iron Castings..	Mar. 15	Ranges, Elec.	Mar. 29
Durable Goods ...	Mar. 22	Indus. Production...	Mar. 29	Ranges, Gas	Mar. 22
Employ., Metalwks..	Apr. 5	Machine Tools ...	Mar. 8	Refrigerators	Mar. 29
Employ., Steel ...	Mar. 8	Malleable Castings...	Mar. 15	Steel Castings ...	Mar. 15
Fab. Struc. Steel...	Mar. 1	Prices, Consumer...	Mar. 22	Steel Forgings ...	Mar. 8
Foundry Equip. ...	Apr. 5	Prices, Wholesale...	Apr. 5	Vacuum Cleaners...	Apr. 5
Freight Cars	Feb. 22	Pumps	Mar. 15	Wages, Metalwks...	Mar. 1
Furnaces, Indus. ...	Feb. 8	Radio, TV	Mar. 29	Water Heaters ...	Mar. 22

business is in store for the best soon.

Future Prospects Dim ...

If there is to be a pickup in business, don't look for it in freight car loadings. Estimates compiled by the 13 regional Shippers Advisory Boards indicate that loadings for second quarter will continue to decline and will fall beneath a like period in 1953 by 16 per cent. Through the week ended Mar. 27, car loadings for revenue in 1954 trailed the same period in 1953 by over 1 million cars. The boards had predicted a 4-per-cent drop in first quarter from the like quarter a year ago, but in the first 12 weeks of the period the decline was actually 11.4 per cent.

Railroad profits have reflected the sharp cut in business, too. Estimated income of 130 Class I railroads in February, after interest and rentals, was \$21.5 million compared with \$56 million in February, 1953, according to the Association of American Railroads. Net income for the first two months of 1954 was \$40 million compared with a net of \$114 million for the corresponding period of 1953.

A Drop in the Bucket ...

Unemployment seems to be leaching off, the Department of Labor reports. From mid-February to mid-March, only 54,000 were added to the nation's list of unemployed. Compared with the increase of 584,000 for the previous month, mid-February that is a drop in the bucket. On the other hand, 61 million persons had jobs in March, an increase of 45,000 over February. The simultaneous increases were made possible by the addition of about 100,000 persons to the calculated labor force—the total of people willing and able to work.

Incurable Optimists ...

There continues to be enough optimism in business circles to keep a rosy tinge on any business forecast. In a survey conducted by Dun & Bradstreet Inc., businessmen who believe net sales in second quarter, 1954, will top net sales of second quarter, 1953, outnumbered by three to two those who

BAROMETERS OF BUSINESS

INDUSTRY	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Steel Ingot Production (1000 net tons) ²	1,621	1,624	2,190
Electric Power Distributed (million kwhr)	8,463	8,491	8,019
Num. Coal Output (daily av.—1000 tons)	1,113	1,125	1,394
Petroleum Production (daily av.—1000 bbls)	6,400 ¹	6,452	6,341
Construction Volume (ENR—millions)	\$329.5	\$283.6	\$344.1
Automobile, Truck Output (Ward's—units)	143,299	149,562	170,567
ADDITIONAL			
Eight Car Loadings (unit—1000 cars)	595 ¹	601	705
Business Failures (Dun & Bradstreet, no.)	267	277	171
Currency in Circulation (millions) ³	\$29,701	\$29,632	\$29,754
Rpt. Store Sales (changes from year ago) ³	-11%	-13%	+11%
FINANCIAL			
Bank Clearings (Dun & Bradstreet, millions)	\$17,957	\$20,426	\$18,128
Federal Gross Debt (billions)	NA	\$270.5	\$264.5
Bond Volume, NYSE (millions)	\$15.7	\$16.8	\$14.3
Stock Sales, NYSE (thousands of shares)	10,785	9,167	9,826
Bonds and Investments (billions) ⁴	\$79.2	\$80.8	\$77.8
U. S. Gov't Obligations Held (billions) ⁴	\$31.6	\$32.8	\$30.7
PRICES			
STEEL's Finished Steel Price Index ⁵	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index ⁶	212.5	208.6	230.5
All Commodities ⁷	110.9	110.8	110.0
Commodities Other Than Farm & Foods ⁷	114.4	114.4	113.4

Notes on request. ¹Preliminary. ²Weekly capacities, net tons: 1954, 2,384,549; 1953, 254,459. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100. NA=Not Available.

believed there will be a decline. More than one-fourth of those queried said they saw no change in sales between the two quarters. Manufacturers of nondurable goods were more optimistic than durable goods producers.

With partial support of that survey is the word from the Office of Business Economics that while manufacturers' shipments in February were a little under the January rate, new orders improved by about \$1 billion on a seasonally adjusted basis. Most of the increase was in nondurable goods. Combine that with the fact that buying policies, as reported by the Purchasing Agents Association of Chicago, are still largely in the 30-60 days-or-more range and it is possible that the increased orders will show up in April or May production figures.

Heavy Construction Goes Up . . .

As spring sets in, heavy construction sets in, too. *Engineering News-Record* reports that new orders for heavy construction in the week ended Apr. 1 amounted to \$330 million, the highest weekly total of the year. The upsurge closed the gap between current and year-ago figures from 41 per

cent below at the end of February to only 31 per cent below at the end of March. Awards total \$2.8 billion for the first 13 weeks of this year compared with slightly over \$4 billion during the same period last year. Aberthaw Co., construction managers in Boston, reports the cost of industrial construction advanced slightly in the first quarter from 392.2 on Dec. 31 to 393 on Mar. 31, based on 1914 as 100.

Trends Fore and Aft . . .

Don't expect a rush for color TV sets even though Westinghouse did cut its prices—all the way from \$1295 down to \$1110 . . . Revere Copper & Brass will diversify its product line with more than 60 copper-clad stainless steel utensils for hospitals, school cafeterias, hotels and other institutions . . . American Steel Foundries will close its East St. Louis, Ill., plant Apr. 16 because of lack of orders . . . James J. Nance, president of Packard Motor Car Co., says, "There are definite signs of a sound business upturn, with it being shown most strongly in the southern part of the country where seasonal sales patterns normally are seen early."

"I Say Sheet Coil"



THIS IS COLD ROLLED SHEET COIL

Produced by High Speed Rolling in Continuous Mills, Hot-rolled Sheet Mills and Cold-rolled Sheet Mills.



"I Say Thinsteel"

Which kind of Cold Rolled Strip Steel is best for You ?

CONSIDER SHEET COIL

- if variations in physical characteristics are permissible.
- if fairly heavy oversize gauge variations are not objectionable.
- if the fabricating operations are not too complicated and do not require intricate expensive dies.
- if a fine surface finish is not essential.
- if a good base for paint or enamel is desired.
- if you do not object to some "square footage" loss due to oversize variation.
- then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

- if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
- if you wish to keep die wear low, no oversize gauge variations.
- if you require a fine finish or a better base for plating.
- if you want maximum yield for "most finished parts per ton."
- if you want selected tempers for maximum strength and lightest weight.
- then you'll find Thinsteel the most economical material by far.

No Argument Here . . .



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You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

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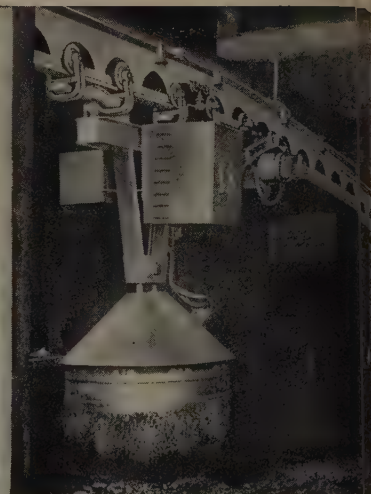
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Teletype: Roselle, N. J. 387

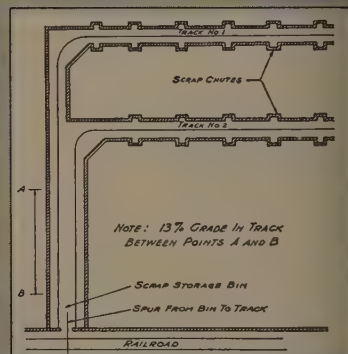
Automatic Steel Scrap Disposal System

Removes Chips and Shavings Without Attendants



View of tracks near beginning of tunnels. Carrier is shown approaching track in cline on way to bin with a load.

A load of scrap about to be dropped in bin. Carrier immediately reverses after unloading and starts another trip.



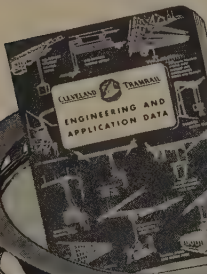
ONE carload of metal chips and shavings is picked up and moved daily with an automatic Cleveland Tramrail magnet-carrying system that operates unattended in two parallel tunnels under metal-working machines.

Each tunnel has its own Tramrail track on which a

magnet carrier travels back and forth, picking up scrap that comes down from the machines on floor above. The scrap is conveyed to a bin next to a railroad siding. The system was put into operation in 1942 and has proven an extremely efficient and low-cost method for ferrous scrap disposal.

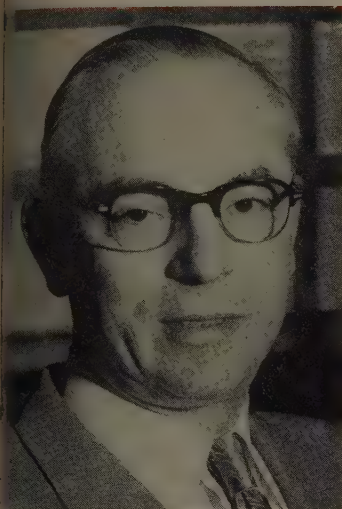
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THE CLEVELAND CRANE & ENGINEERING CO.
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CLEVELAND  TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



GLENN C. LECHLEITNER
... gen. mgr. at Cleveland Punch & Shear



G. A. PROFITA
... a reg. mgr. for B&W's boiler division



M. C. PETERSON
... Warner Electric automotive sales mgr.

Glenn C. Lechleitner was made general manager of Cleveland Punch & Shear Works Co., Cleveland. Associated with the company four years, he previously held the posts of sales engineer and sales manager.

H. Stillbach, president of Allied Products Corp., Dorchester, Mass., was elected president and a director of LaPointe Electronics Inc., Rockville, Conn. Jerome E. Resness resigned as president and was made vice president in charge of sales. Milby M. Hancock was named assistant secretary and assistant treasurer.

Richard A. Modig, general sales manager, Holo-Krome Screw Corp., Elmwood, Conn., was elected vice president-sales. William J. Basile was made treasurer.

Graham H. Anthony, chairman of the board of Veeder-Root Inc., Hartford, Conn., was elected chairman of the executive committee. John H. Chaplin, president, was named chairman of the board of directors and is succeeded as president by Harvey L. Spaunburg, former executive vice president.

Globe Steel Tubes Co., Milwaukee, promoted Norman E. Wenzel from superintendent of industrial engineering to manager of plant operations. He is succeeded by Eugene J. Kub.

G. A. Profita was named regional manager, manufacturing department, at Babcock & Wilcox Co.'s boiler division, New York. He was previously co-ordinator of manufacturing and production activities at the Wilmington, N. C., and Brunswick, Ga., plants. In his present position his work embraces these plants in addition to those at Alliance, O., West Point, Miss., and Paris, Tex.

New works manager for Pheoll Mfg. Co., Chicago, is J. D. Goodall who replaces D. C. Eisendrath, resigned.

Hugh Glen was elected president of Johnston Pump Co., Pasadena, Calif. He formerly was president of Emsco Derrick & Equipment Co. He succeeds Mrs. Thomas W. Simmons who has resigned as president but is still sole owner of the firm.

At New Britain Machine Co., New Britain, Conn., Ralph S. Howe succeeds Robert T. Frisbie as president. Mr. Frisbie was elected chairman of the executive committee. Julian C. Pease, who continues as general manager, New Britain Gridley Machine Division, was elected vice president. Clarence E. Bachman becomes vice president in charge of the products division and George G. Wilcox vice president-hand tool division.

M. C. Peterson was named automotive sales manager, Warner Electric Brake & Clutch Co., Beloit, Wis. Well known in the automotive industry, he formerly served as regional sales manager for Willys-Overland Motors Inc. and vice president of Flex-O-Tube Co. He joined the Warner staff as Chicago district manager, automotive division, in 1951. Prior to his new appointment he was manager of national account sales.

Coast Metals Inc., Little Ferry, N. J., elected George S. Mikhailapov president to succeed John P. Rutherford. Previous to World War II, Mr. Mikhailapov served Taylor-Winfield Corp. in Warren, O., as director of research and development. Following the war he joined Air Reduction Co. as manager of its apparatus research department. In 1951 he became affiliated with General Electric's Knolls Atomic Power Laboratory.

Harmon S. Eberhard was elected president, Caterpillar Tractor Co., Peoria, Ill., and Louis B. Neumiller was elevated to chairman of the board. Mr. Eberhard was executive vice president and previously served as vice president of engineering and manufacturing.

Dravo Corp., Pittsburgh, appointed Arthur W. Gulliver to its New York office staff as application engineer



JOHN WRIGHT JR.
... joins Oldham-Rust Co. sales force

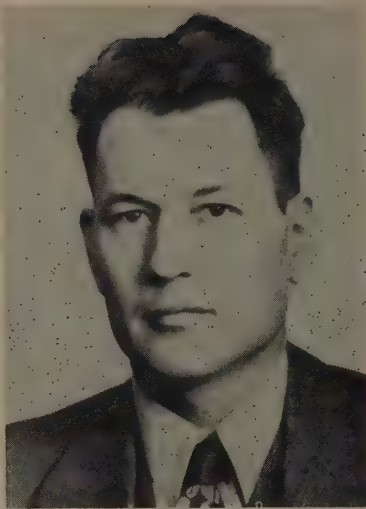
to handle the sale of fabricated piping.

John Wright Jr., formerly with Rosan Inc., was appointed manager of industrial sales for **Oldham-Rust Co. Inc.**, manufacturers' representative, New York. He will concentrate efforts on behalf of **Townsend Co.**, New Brighton, Pa., manufacturer of rivets, nails and similar products and will be assisted by **C. E. Eggers** and **E. S. Miller**.

Milton J. "Tex" Wurzbach was made assistant director of public relations for the Cleveland district of **United States Steel Corp.** He succeeds **Alvin L. Krieg**, now director of public relations in the Utah-Intermountain district.

J. Harrahill was named plant manager and **F. K. Richardi** assistant plant manager of the newly completed factory on the outskirts of Lancaster, Pa., constructed by **Permutit Co.** Mr. Harrahill has been serving the subsidiary company, **Simplex Valve & Meter Co.**, Philadelphia, as plant manager. Mr. Richardi joined **Permutit** in January, 1952, as assistant plant manager of the Brooklyn, N. Y., plant, a position formerly held by Mr. Harrahill.

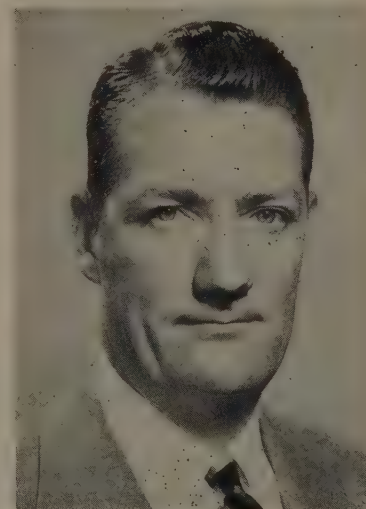
Simplex Valve & Meter Co., Philadelphia, subsidiary of **Permutit Co.**, appointed **George L. Walker** district manager of its New York office.



J. H. BEARDSLEY
... Bryant Chucking Grinder exec. v. p.

J. H. Beardsley was elected executive vice president, **Bryant Chucking Grinder Co.**, Springfield, Vt. A director since 1946, he joined Bryant in 1948 after association with **Jones & Lamson Machine Co.** He has since served as assistant to the president, general manager and vice president. He is also president of **E. G. Staude Mfg. Co. Inc.**, St. Paul, a subsidiary.

J. F. Schirtzinger was appointed president and general manager of **Consolidated Tool & Products Co.**, Los Angeles. He succeeds the late **Anthony Oberholtz**. Mr. Schirtzinger has been with **Convair's** San Diego, Calif., division.



J. F. SCHIRTZINGER
... heads Consolidated Tool & Products



D. H. GARDNER
... Sunbeam's industrial furnace gen. m.

D. H. Gardner was appointed general manager of **Sunbeam Corp's** industrial furnace division, Chicago. Since 1946 he served the division as Detroit district sales manager. **J. T. Williams** was assigned to the Detroit area and **L. B. Canfield** to the Philadelphia area. **L. W. Prestin**, former vice president and division general manager, was elected vice president of Sunbeam's subsidiary at Toronto, Ont.

Jack Saunders was made manager of a new sales district of **Aacanda Wire & Cable Co.** which includes all of Florida with sales office in Tampa. **Robert W. Camichael** will work with Mr. Saunders in the new location. **Frank D. Dickey** was made manager of the San Francisco district to succeed **Lee Hayward**, resigned.

John W. Spoor was appointed to the newly created post of assistant division manager, welding products division, **A. O. Smith Corp.**, Milwaukee. He is succeeded as general sales manager by **Richard V. Raney**.

Claude W. Mottinger, purchasing agent for the rubber division of **Hewitt Robins Inc.**, Buffalo, assumes the newly created position of purchasing director for the tire company.

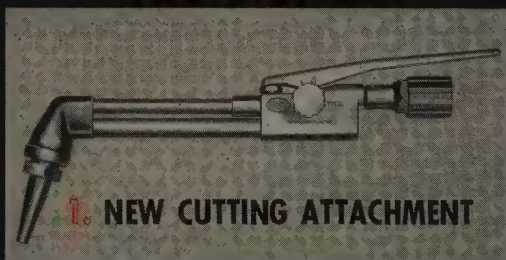
J. H. Webber was made assistant manager of tubular products sales general offices, Oakland, Calif.

Composite photo of one torch
and jet mixer with three differ-
ent welding tips: 13, 7 and 1.

two new reasons

why the **AIRCO** 800 is the ...
MOST VERSATILE TORCH
YOU CAN BUY

**2. NEW
JET
MIXER**



1. NEW CUTTING ATTACHMENT

The Airco Style 800 torch will handle any welding, heating or cutting job, thanks to the brand new Airco Jet Mixer and two completely redesigned cutting attachments.

The new Jet Mixer gives you perfectly stable flame control with all gas flows. Cyclonic action swirls the gases together, mixing them completely, within a tip size range from 0 to 14 inclusive. Rubber gas sealing rings provide a gastight seal with hand tightening, no wrench required . . . saves time in tip changes.

New heavy-duty cutting attachment takes all standard tips; cuts steel up to 8" thick! Medium-duty attachment available for lighter service. Both have rubber gas sealing rings, plus mixers which can be easily removed for cleaning, if necessary.

Owners of Style 800 torches can use the new Jet Mixer and cutting attachments with their present torches. For details, write to Air Reduction or see your Airco dealer, asking for your copy of Catalog 818, "Hand torches for gas welding and cutting."

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with offices and dealers in most principal cities*

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Cuban Air Products Corporation



GLENN D. EASTON
... Lovejoy Tool chief engineer



FRED J. WATT
... Worthington air conditioning-refrig.



CHARLES W. LEDIG
... sales mgr. for National Pneumatic

Kaiser Steel Corp. T. H. Wakeman was made mid-continent district sales manager, Tulsa, Okla.

Glenn D. Easton was made chief engineer for Lovejoy Tool Co. Inc., Springfield, Vt., to succeed E. B. Lucarini, retired. Mr. Easton has served in the engineering department since joining the company in 1941.

Scott H. Hanville Jr. joined Jack & Heintz Inc., Cleveland, as manager of technical sales, a newly created post.

Charles F. McCabe and Joseph H. Famme were appointed assistant chief engineers in the San Diego, Calif., division of Consolidated Vultee Aircraft Corp. They replace the late N. W. Bouley and Joseph F. Schirtzinger, who resigned.

Fred J. Watt was named manager of a newly combined section of Worthington Corp.'s air conditioning and refrigeration division at Harrison, N. J. It will be known as the central station and ammonia equipment section.

Hal P. Kibbey was appointed assistant vice president-sales, United States Steel Supply Division, U. S. Steel Corp., Chicago. He formerly was Chicago district manager of this warehousing division. Clyde B. Colwell Jr., district manager, St. Paul, was promoted to district manager, Chicago. Earl L. Simanek, assistant district manager, Chicago, was promoted to district manager, St. Paul.

Charles J. Fellrath succeeds Fred A. Thomson, retired, as secretary of Ford Motor Co., Detroit.

National Pneumatic Co. Inc. and Holtzer-Cabot Divisions, Boston appointed Charles W. Ledig sales manager of the company's actuators and controls division.

Edward E. Goodwillie, assistant vice president-sales, Bethlehem Steel Co., Bethlehem, Pa., since 1934, has retired. He is succeeded by Sigmund L. Holverstott.

Charles W. Harrison will serve as sales engineer in the Houston district for Ingalls Iron Works Co. and its subsidiaries, Ingalls Shipbuilding Corp. and Ingalls Steel Construction Co.

Lloyd W. Ingles was named superintendent of Colorado Fuel & Iron Corp.'s new Allen Mine at Weston, Colo. He succeeds H. D. Pinkney, resigned. Mr. Ingles was superintendent of CF&I's Fredrick Mine

OBITUARIES...

Harry A. Leigh, 68, executive vice president, treasurer and a director of Seymour Mfg. Co., Seymour, Conn., died in Florida of a heart attack Mar. 28.

Walter E. Punskey, 62, vice president, Baltimore Porcelain Steel Products Co., Baltimore, died Mar. 28 in Toledo, O.

Julian L. Fish, 61, general purchasing agent, Otis Elevator Co., New York, died Mar. 30 in Florida.

William J. Aldridge, 64, works

manager of Foster Wheeler Corp.'s plant in Wilkes-Barre, Pa., died Mar. 31.

Valentine Fina, 72, president and treasurer of Milwaukee Valve Co., Milwaukee, died Mar. 30.

Fred S. Markert, 53, executive vice president, Ferro Corp., Cleveland, died Mar. 29.

John J. Prehler, 69, president of Kondu Corp., Erie, Pa., died Mar. 26.

Harold K. Hennessey, 67, purchasing agent at the Bond plant of

American Radiator & Standard Sanitary Corp., Buffalo, died Mar. 26.

Dan M. Rugg, 64, vice president Koppers Co., Pittsburgh, in charge of the chemical division, died Mar. 28.

David M. Galloway, 74, former vice president, Dominion Wheel & Foundry, died Mar. 25 in Toronto, Ont.

L. J. Fitzpatrick, 76, retired president, Tonawanda Electric Steel Casting Corp., North Tonawanda, N. Y., died Mar. 29.

Don't wait... Investigate the Kearney & Trecker **TOOL-LEASE** **P R O G R A M**

**Here's a common sense
approach to your plant
modernization program**

**It's the most significant opportunity
ever offered users of milling machines and
precision boring machines**

In these times, modernization is the soundest approach to meeting increasingly competitive conditions. And the best way to modernize — to improve products, cut costs, gain productive flexibility — is to retool with new machines. Today, Kearney & Trecker's new Tool-Lease Program offers you an unmatched opportunity to "junk the clunkers" that are nibbling away at your profits. It's time to act. Don't wait — investigate!

**These are only a few of the advantages
Tool-Lease offers you**

You can try out new machines in your own plant . . . without being obligated to purchase them. You can get hitherto impossible flexibility and capacity to take advantage of changing production requirements without risk of obsolescence. Last, but not least, you can expand production without tying up working capital, going into debt, or impairing future borrowing capacity.

**Tool-Lease helps you get the exact
milling or boring machines you need**

Under Tool-Lease, you can rent any Kearney & Trecker standard knee or bed type milling machine or precision boring machines. If you

require special machinery or heavy-duty CSM bed-types, special agreements will be considered.

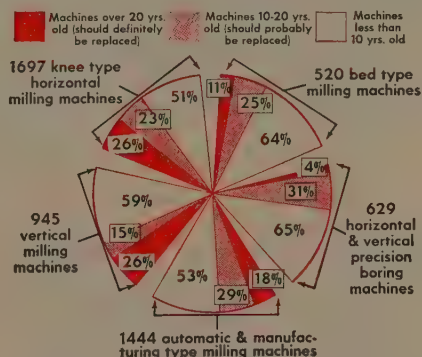
Three basic plans give you varying options to continue or terminate the lease or purchase the equipment.

**For complete details on Tool-Lease . . . help in
analyzing your milling and precision boring
needs — see your Kearney & Trecker representa-
tive or mail coupon to Kearney & Trecker Corp.,
6784 W. National Ave., Milwaukee 14, Wis.**

THE CRITICAL PICTURE OF CREEPING OBsolescence . . . AND HOW TO STOP IT!



Let's take a typical basic industry as an example — Agricultural equipment. Of the 5235 standard knee type horizontal, vertical, bed and manufacturing milling machines and precision boring machines in use today — *which could be replaced by Tool-Lease equipment* — 26% are 10-20 years old, 19.9% are more than 20 years old.



Kearney & Trecker Corporation
6784 W. National Ave., Milwaukee 14, Wis.
Please send me Bulletin TL-10A with details on the Tool-Lease Program. ☐ Check here if you would like to have a representative call on you as soon as possible (or call Milwaukee, GRGreenfield 6-8300).



Name.....
Title.....
Company.....
Address.....
City..... Zone..... State.....

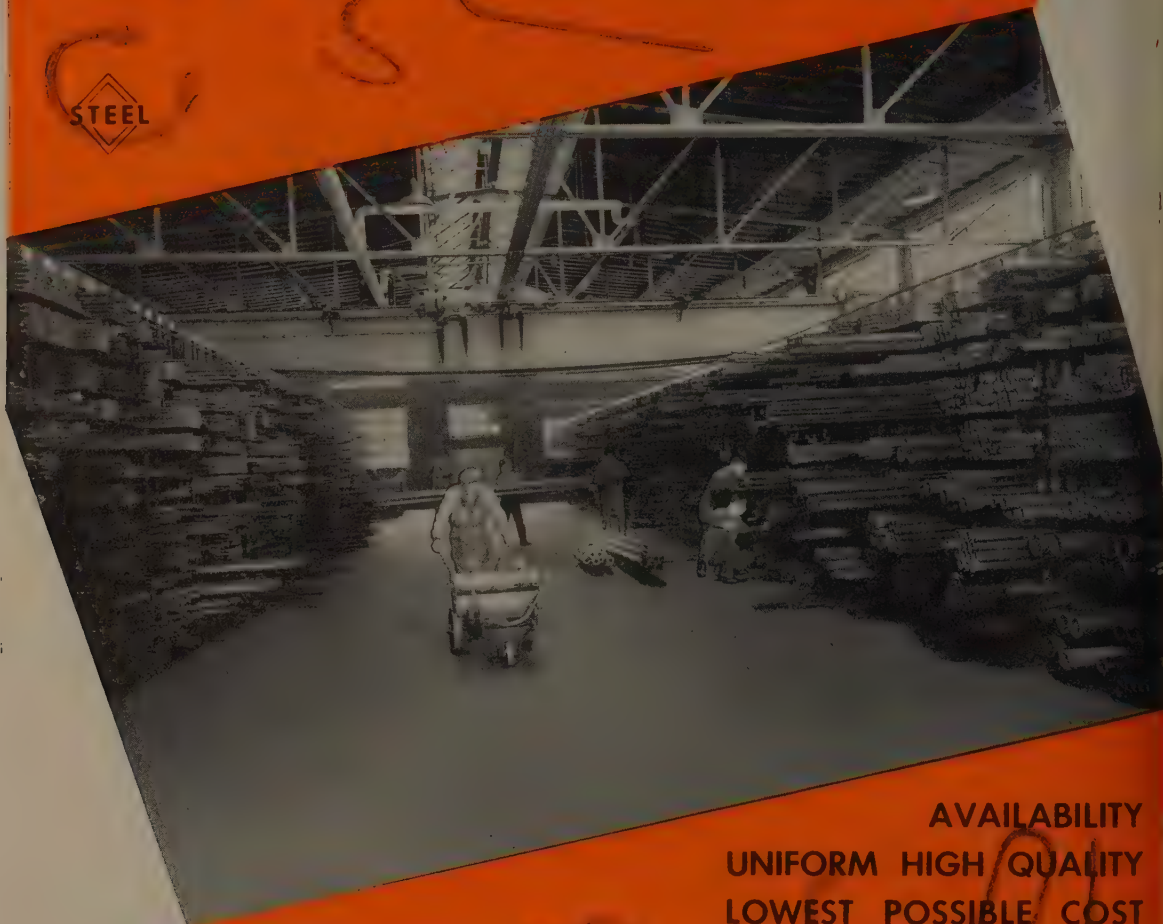


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STEEL TUBING SEAMLESS, WELDED AND BUNDYWELD

ALL SIZES NOW AVAILABLE
FOR IMMEDIATE DELIVERY

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AVAILABILITY
UNIFORM HIGH QUALITY
LOWEST POSSIBLE COST

We carry one of the most complete stocks of tubing in the country in our Warehouses. Manufacture is under careful control from laboratory inspection of the raw material to the finished tubing, with the result that our product is of a uniformly high quality.

In order to provide the most suitable tubular product for the desired application at the lowest possible cost, we give specialized attention to fitting the tube to the job. The knowledge gained from our experience, acquaintance with the products of different mills, and the advantages and limitations of various tubular products is available to solve your tubing problems

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GE floodlights illuminate the Yankee Stadium

PLAY BALL!

Aluminum Brightens the Night

General Electric's River Works, Lynn, Mass., turns out floodlights to make night baseball games daylight-bright



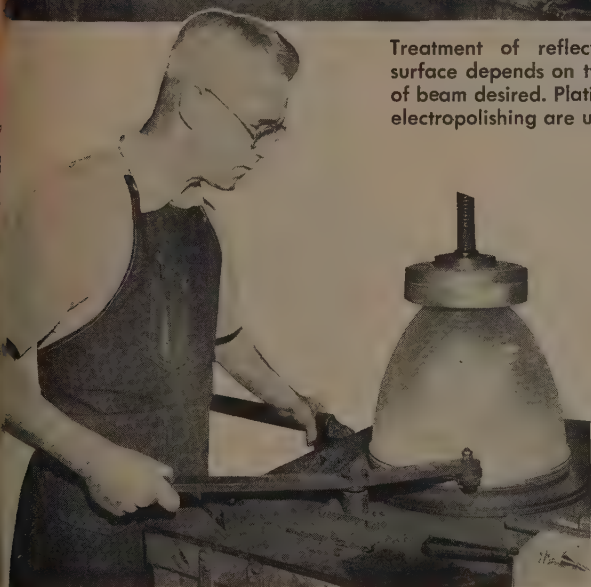
Aluminum blanks for sports floodlight reflectors are squeezed into shape on Hydroform press



Treatment of reflective surface depends on type of beam desired. Plating, electropolishing are used



Reflectors get a fast, uniform buffing in special machines



On assembly line sockets for bulbs are inserted
Unbreakable glass is rolled into reflector lip

Republic Expands Tube Mill

Company plans to increase seamless tube production by 70 per cent

REPUBLIC STEEL CORP. is increasing the capacity of its South Chicago seamless tube mill by nearly 70 per cent with addition of new facilities for rolling small-size seamless tubing. This is the first project of the expanded capital expenditure program for 1954, recently announced by C. M. White, president.

The project is scheduled for completion by spring, 1955, and will increase the capacity of the seamless tube mill from 186,000 tons a year to 312,000 tons a year.

Major equipment to be installed includes a billet heating furnace, piercing mill, plug mill and two reelers. Completion of the new mill will enable Republic's seamless mills to produce bearing tubing, refinery piping and other seamless tubular items in addition to the oil country tubular goods now being made.

Kropp Enlarges Facilities

Kropp Engineered Products, Cicero, Ill., a subsidiary of Kropp Forge Co., Chicago, is installing \$1.5 million worth of machinery and equipment which will enable the company to perform all types of machining of both ferrous and nonferrous metals. New facilities include milling machines, various types of lathes, grinders, shapers, die-sinking equipment, drill presses, tool grinding and sand blasting equipment, magnaflux and ultrasonic testing machines and precision jig bore equipment.

Nord Moves to New Plant

Nord International Corp. opened a plant at Orange, N. J., where the main office and experimental and development departments will be located. These were formerly at Denville, N. J.

Westinghouse Rearranges

Westinghouse Electric Corp. plans to rearrange productive facilities at its Trafford Micarta Division plant, Trafford, Pa. About

half of Micarta division's production of laminated plastics will be moved to the division's Hampton, S.C., plant, and other operations will be moved into the space made available at Trafford.

Form Ore Treating Division

Dwight-Lloyd Inc., a new division of Sintering Machinery Corp., Netcong, N. J., has been formed to design, construct and sell ore beneficiation plants and related process equipment. The current research program of Dwight-Lloyd has resulted in new equipment and processes for the economical treatment of taconite and other low-grade ores. H. E. Rowen is vice president.

Inco Center Built for Speed

International Nickel Co.'s new \$1.7-million distribution center at Huntington, W. Va., includes engineering innovations for product protection, high-accuracy "print-weight" scales and one of the largest truck terminals in metal warehousing. The unit is planned and engineered to speed operations and has the latest equipment for straightening, cutting and inspecting its metal products.

Brady & Associates Buy Firm

Arnold W. Brady & Associates management engineering and consulting firm, Detroit, purchased all the outstanding stock of Townsend Industries Inc. of that city. The company specializes in metal stampings, assemblies and production painting for the automotive aircraft, air-conditioning and radio-television industries.

Hydraulic Lab Completed

Worthington Corp., Harrison, N. J., completed its hydraulic test laboratories at Harrison. Designed basically for production or performance testing, the lab will also be used for applied research and development of fluid handling machinery. Field conditions can be duplicated for the more than 10,000 different types and sizes of pumps currently being produced.

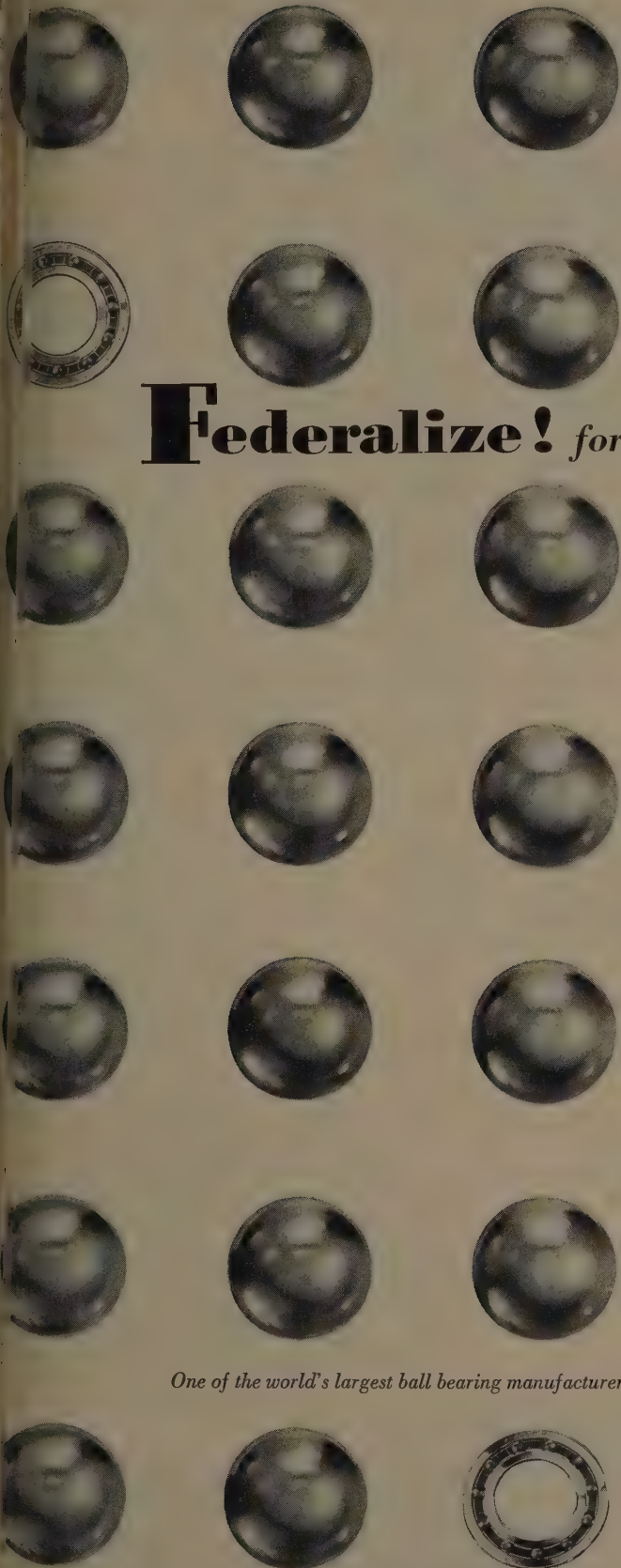
Cyanamide for South Africa

A calcium cyanamide plant, being constructed by South African Cyanamid (Pty.) Ltd. at Witbank, will for the first time make the Union of South Africa self-sufficient in production of Aero brand cyanide, a key chemical used in



Going Up? TV Tower Has Built-In Elevator

Television tower of WHIO-TV, Dayton, O., built by Blaw-Knox Co., Pittsburgh, is 1104 ft high, so built-in elevator is appreciated by maintenance men. 14-ft triangular tower weighs 600,000 lb; base is buried concrete pyramid weighing 832,000 lb. Nine guy wires containing over 8000 ft of cable steady the tower



Federalize! *for tomorrow's tools today*

Take a *new look* at Federal!

You'll see how one of the world's largest ball bearing producers keeps ahead in this ever-changing world.

You'll see at Federal automated production that keeps quality at a peak.

You'll see at Federal the newest precision machines—modern machines that make yesterday's wide tolerance bearings as primitive as the equipment they served.

You'll see, too, the latest quality control instruments and inspection methods in use at Federal.

Keep ahead or fall behind is the order of the day. Most alert to that are the purchasing agents and purchasing powers who won't wait till tomorrow for something that can be better today.

These purchasing powers are seeing how yesterday's No. 2 sources of supply have earned the right to become today's No. 1. And they are fast coming to recognize Federal ball bearings as the *modern* leaders in their field.

Federalize—and you've modernized.

Federalize—and you're ahead!

One of the world's largest ball bearing manufacturers THE FEDERAL BEARINGS CO., INC.

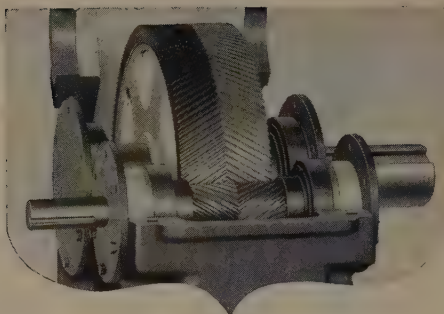
POUGHKEEPSIE, N. Y.

Producers of the *Modern* ball bearing

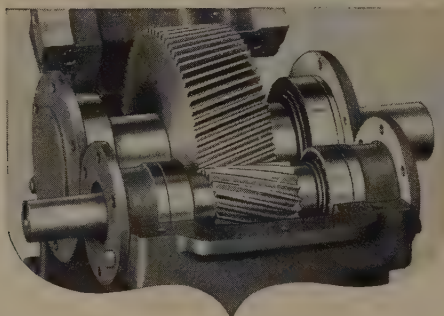
Federal

Ball Bearings

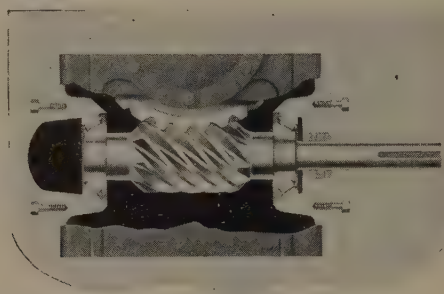




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for Unbiased Selection of Type

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THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

the mining industry. At present calcium cyanamide is imported from the firm's parent company Canada, North American Cyanamid Ltd.

Guarantees Against Price Drop

Fresh'nd-Aire Co., a division of Cory Corp., Chicago, notified its distributors that inventories of Fresh'nd-Aire 1954 room air conditioners will be guaranteed against price decline throughout the 1954 air-conditioner season.

Electroplater Expands

The Hanson-VanWinkle-Munnin Co., Matawan, N. J., acquired the assets, customer lists, good will, personnel and existing business of Electroplating Equipment & Supply Division of A. J. Lynch Co. in California. The new owner will utilize warehousing and shipping facilities of Lynch and maintain offices in Lynch buildings at Los Angeles and San Francisco. The Matawan firm manufactures electroplating and polishing processes equipment and supplies.

Plastics Sales Group Formed

A plastics sales group has been formed by Hooker Electrochemical Co., Niagara Falls, N. Y., to handle the company's new fire-resistant polyester resin. Charles Y. Cain heads the group.

New Oxygen Plant Opened

National Cylinder Gas Co., Chicago, is operating a new oxygen plant at Tampa, Fla. The company, which manufactures welding and cutting equipment in addition to industrial gases, now has 55 oxygen and 37 acetylene plants in the United States, Canada, Colombia and Venezuela.

Knox Develops New Weed Killer

A new weed killer tailored to the specific requirement of industrial weed control has been developed by Knox Chemical Co., Chicago. Named Knox-All, the weed killer eliminates all foliage and sterilizes the soil, eliminating the growth of any new vegetation from 1 to 5 years. It is also rated as an ex-

SEALTITE TYPE U.A. BY AMERICAN BRASS COMPANY

PERMANENT
EASILY INSTALLED
LIQUID-TIGHT
EASILY MAINTAINED
PROTECTS WIRING

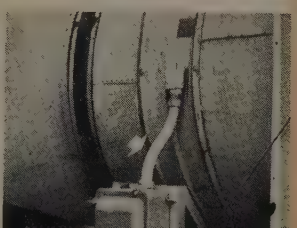
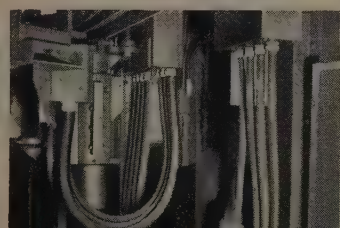
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FOR WET SPOTS

MOVING CONNECTIONS

OUTDOORS

MISALIGNMENT



SEALTITE

ELECTRICAL CONDUIT PROTECTS WIRING

against oil, grease, water, dirt, chemicals,
corrosive fumes, salt spray, weather

SEALTITE* is a flexible *and* liquid-tight electrical conduit. It gives maximum protection to your wiring when it must connect moving parts, absorb vibration, follow machine contours, flex into U-bends, be easily maintained or be safeguarded between misaligned ports.

It is being used successfully in wet locations, in tunnels, power plants, steel mills, canneries, chemical industries and in many outdoor applications. **SEALTITE** comes in two types:

TYPE U.A.—UL-approved. Made with flexible galvanized steel core, positive ground and tough outer cover.

NOM. I.D. (Inches)	INSIDE DIA. (Inches)		OUTSIDE DIA. (Inches)		APPROX. INSIDE BEND DIA. (Inches)	EST. WEIGHT per hundred ft. (Pounds)
	Min.	Max.	Min.	Max.		
3/8	.484	.504	.690	.710	8	30.0
1/2	.622	.642	.820	.840	10	36.6
3/4	.820	.840	1.030	1.050	15	48.2
1	1.041	1.066	1.290	1.315	18	87.7
1 1/4	1.380	1.410	1.630	1.660	21	116.5

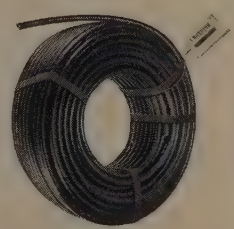
TYPE E.F. † (Extra Flexible)—for machine tools and industrial equipment. (Meets standards set by J.I.C.) †Pat. Applied For

NOM. I.D. (Inches)	INSIDE DIA. (Inches)		OUTSIDE DIA. (Inches)		APPROX. INSIDE BEND DIA. (Inches)	EST. WEIGHT per hundred ft. (Pounds)
	Min.	Max.	Min.	Max.		
3/8	.485	.505	.690	.710	5	24.3
1/2	.620	.640	.820	.840	6	29.0
3/4	.815	.835	1.030	1.050	9	38.2
1	1.025	1.055	1.290	1.315	10	65.0
1 1/4	1.365	1.395	1.630	1.660	13	84.4
1 1/2	1.575	1.605	1.870	1.900	15	122.0
2	2.020	2.055	2.335	2.375	17	158.0
2 1/2	2.480	2.515	2.840	2.875	20	205.0
3	3.070	3.110	3.460	3.500	27	290.0
4	4.000	4.050	4.460	4.500	34	430.0

Commercial tolerances apply on above figures.

ELECTRICAL WHOLESALERS stock both types. Buy it in long random lengths as shown; then cut without waste. Or ask your wholesaler to cut the length you need. Liquid-tight connectors are available from wholesalers' stocks. Write for Bulletin UA-531. *The American Brass Company, American Metal Hose Branch, Waterbury 20, Conn.*

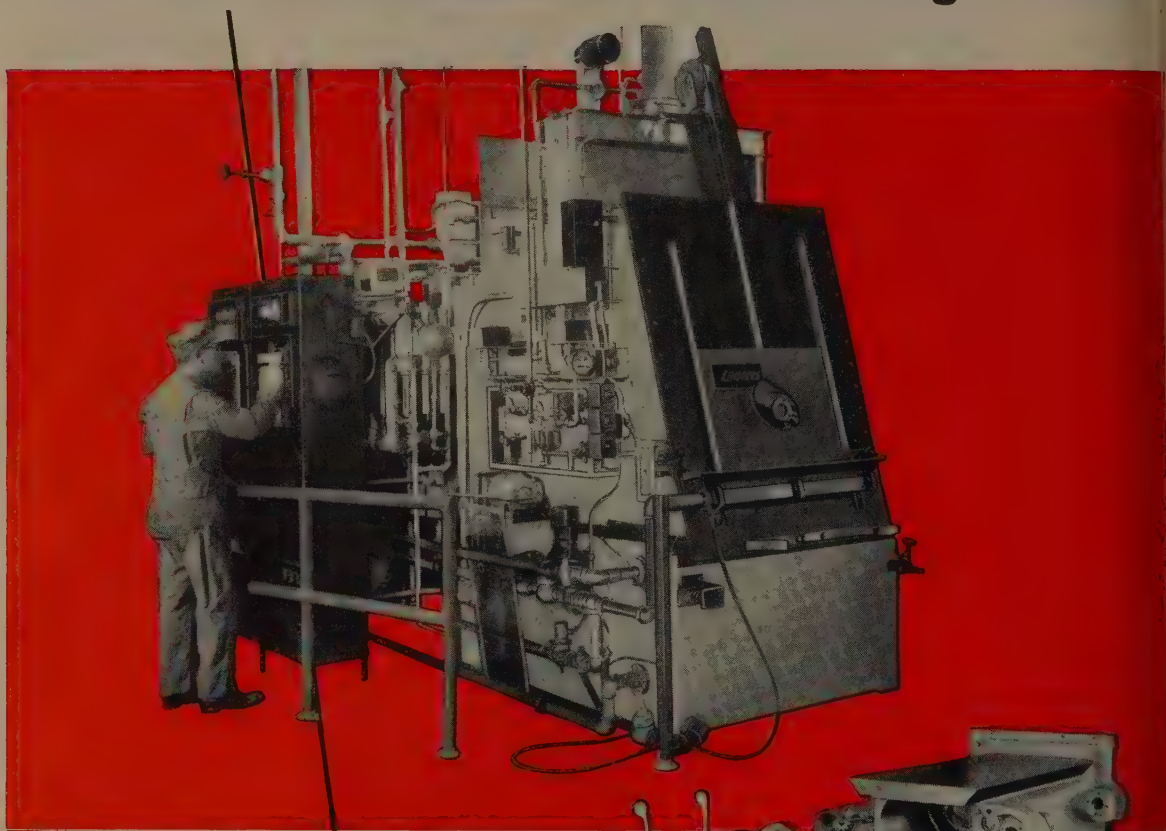
*Trade Mark 54175



SEALTITE

flexible, liquid-tight electrical conduit an **ANACONDA®** product

Kearney & Trecker Cuts Gear Carburizing Time 4½ Hours with **LINDBERG** Carbo-nitriding Furnace!



Eight hours! That's how long it formerly took Kearney & Trecker's heat treating department to carburize a 300 pound charge of "secondary feed change cams and gears" to .030 case depth . . by pack carburizing and hardening in pit furnaces.

But now, with a new Lindberg Carbo-nitriding Furnace, K & T heat treaters handle the complete job in only 3½ hours . . a saving of 4½ hours over the old method!

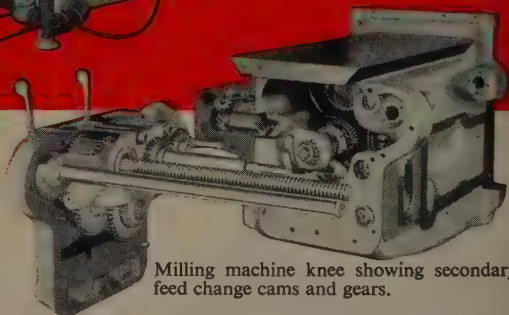
This "before and after" procedure list tells the story:

BEFORE . . . with old box furnace and pit hardening furnace.

1. Pack parts in box
2. Load in carburizing furnace
3. Heat to specified temperature
4. Remove box from furnace . . . and cool
5. Remove cooled parts from box
6. Load parts on fixture
7. Lower fixture into pit hardening furnace
8. Heat to hardening temperature
9. Remove heated parts and fixture from work chamber
10. Quench in oil
11. Remove parts from fixture

AFTER . . . with new Lindberg Carbo-nitriding Furnace

1. Place parts in open work basket
2. Load baskets and work into Lindberg Carbo-nitriding furnace.
3. The furnace then takes over, carburizing, hardening and quenching the load automatically without use of fixtures



Milling machine knee showing secondary feed change cams and gears.

And there are other advantages! One operator was released for other important work. Greater uniformity was obtained. Core toughness improved because of the lower temperature used.

But the story doesn't end here. K & T uses this same furnace to carbo-nitride screws, nuts, T-bolts and washers (in 40% less time than with wet cyaniding) . . and also to handle the neutral hardening of studs (at pronounced labor savings).

And there are still other applications! . . carbon correction, and tool treating and annealing. The versatile Lindberg Carbo-nitriding furnace can do a job for you, too . . ask for details and descriptive bulletin No. 241.

LINDBERG FURNACES

Lindberg Engineering Company • 2441 West Hubbard Street • Chicago 12, Illinois

ent termite insect killer, mold destroyer and wood preservative.

Sylvania Builds In Canada

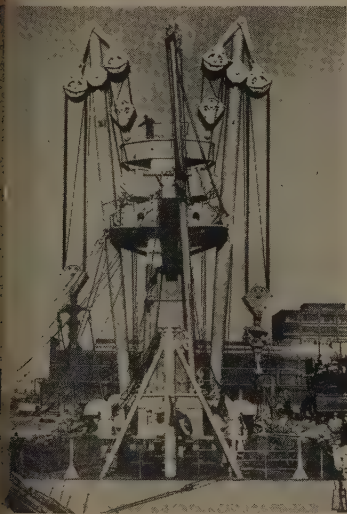
Sylvania Electric (Canada) Ltd. announced that a new plant will be built in Dunnville, Ont., for production of television sets. Indications are that production will get under way this summer. Sylvania will invest about \$750,000 in the plant which will cover 61,000 sq ft of floor space.

Went Heater Agency Formed

Bryant-Daybar Co. Inc., Buffalo, N. Y., has been incorporated by Mark A. Daly Jr. and Edgar J. Redol for wholesale distribution of equipment manufactured by the Went Heater Division of Affiliated Gas Equipment Inc., Monrovia, Calif.

Foundry Opens Division

Howard Foundry Co., Chicago, is opening a new lost wax precision investment casting division in Los Angeles. Close tolerance, complex and unusual castings requiring little, if any, machining are to be produced. Howard also started casting beryllium copper in its Aluminum and Bronze Division at Chicago.



United Press

Hoisting Weight Lifter

Large-handling gear installed by Bethlehem Steel Co., Brooklyn yard, will enable USNS Brostrom to load and discharge cargo without dependence on shore facilities. The gear can handle loads up to 150 tons

the A-B-C

Michigan Electric Resistance WELDED STEEL TUBING

ROUND

$\frac{3}{8}$ " to 4" O. D. 8 to 22 gauge

SQUARE-RECTANGULAR

$\frac{1}{2}$ " to 2" O. D. 20 gauge

1" to $2\frac{3}{4}$ ", 14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

RESISTANCE WELDED STEEL TUBING
Michigan STEEL TUBE PRODUCTS CO.
THE OLDEST NAME IN ELECTRIC

More than 35 Years in the Business

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DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Service Steel Co., Los Angeles, Calif.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston Texas.

of M-S-T

A ALWAYS
MAKES
POSSIBLE
B BETTER
PRODUCTS
C AT LOWER
COST



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Steering Jacket

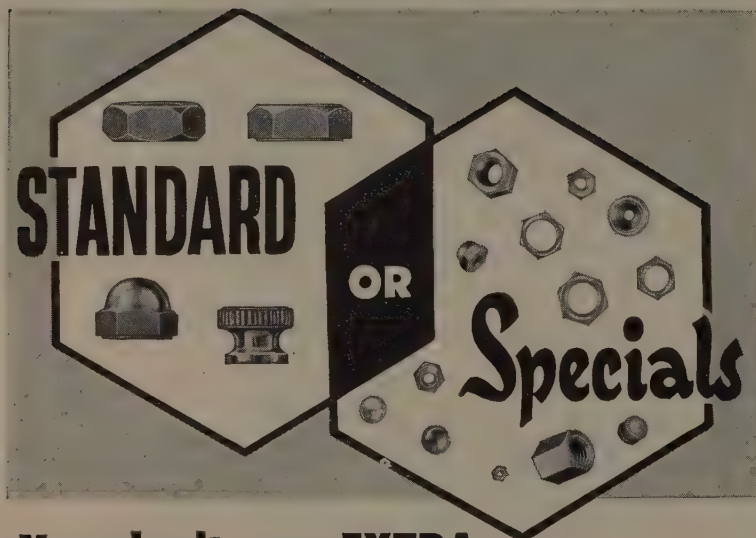
Ready for the automobile assembly line is this vital volume produced tubular part of a major control unit.

Lower tube end is reduced to 2.260" O. D. x 10.525" long, held to close tolerance for assembly in line with body of base tube without machining. Upper end is reduced to 2.125" O. D. x 2.562" long, held on center line to extremely close decimal dimensions, with two perforations at tapered section. Michigan workmanship can always be depended upon to assure the exacting tolerances and part uniformity to keep customer assembly operations moving smoothly.

Michigan engineers will be pleased to work with you on an adaptation of welded steel tubing to help you make your product better at lower cost.



Consult us for engineering and technical help in the selection of tubing best suited to your needs.



**You don't pay EXTRA
for the EXTRA FINE PRECISION of**

"Fischer Turned"

BRASS NUTS

WHY PAY THE PRICE OF PRECISION AND THEN NOT GET IT?

SWITCH TO "FISCHER TURNED" BRASS NUTS! Save when you buy! Save when you use! Held to Class 2 tolerances, "Fischer Turned" Brass Nuts feature 75% full threads and are tapped through at 90° to the face . . . they are countersunk on both sides and completely free from burrs and grease.

There is no galling or seizing or off angle seating with "Fischer Turned" Brass Nuts. You get precision that meets or exceeds AN 340, 341, 345 specifications. Rejection and assembly costs are slashed . . . you produce a better product at a lower cost.

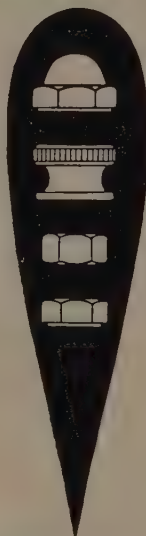
COMPARE PRICE AND PRECISION! Send for samples and quotations on the standard or special size nuts you use. There's no obligation. *Send today!*

Extra Fine Deliveries, Too!

OVER A THOUSAND DIFFERENT SPECIAL SIZES are in regular production along with a complete range of standard size nuts. By dealing with Fischer you get prompt, worry-free delivery . . . your order is guaranteed to arrive on or before the promised delivery date. Specify and order "Fischer Turned" Brass Nuts for **PRECISION, PRICE and POSITIVE DELIVERY!**

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446 Morgan St., Cincinnati 6, Ohio

WESTERN UNION-TELETYPEWRITER-CI-448-U TELEPHONE WOodburn 1280



"Sandwich" Wall

Two sheets of aluminum with glass fiber between are used to cover heavy press plant

A NEW ALUMINUM "sandwich" wall with twice the insulation value of a 12-in. masonry wall was used at the Air Force heavy press plant at the Cleveland Works of Aluminum Co. of America.

How It's Made — The curtain wall is fabricated from two corrugated aluminum sheets with a 1-in.-thick layer of glass fiber insulation between. The plant, one of the first to use aluminum sandwich construction, took 157,711 sq ft of the new siding.

The wall was installed by E. G. Smith Co., Emsworth, Pa., and Toledo, O., who submitted the over-all low bid for the contract which also covered the erection of roof deck, ventilators, built-up roofing and other superstructure items.

No Prefab Needed—The wall was constructed on the job. First a layer of 0.024-in. Alcoa corrugated aluminum siding was applied with self-tapping screws to the siding girts of the structural steel framework. The Fiberglas (Owens-Corning Fiberglas Corp.) insulation was temporarily bonded to the sheet with a reclaimed rubber adhesive. Then the outer layer of 0.032-in. Alcoa industrial siding was secured to the structure with self-tapping screws which also permanently hold the insulation in place.

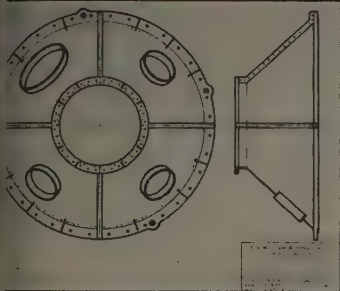
Federal Changes Name

Stockholders of Federal Enterprises Inc., Chicago, voted to change the company name to Federal Sign & Signal Corp. The company makes outdoor electric signs and industrial, emergency and military signaling devices.

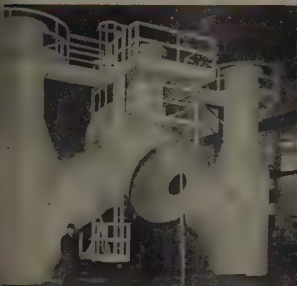
Wheatland Tube Expands

Wheatland Tube Co., Philadelphia, is rapidly completing its Wheatland, Pa., plant expansion program adding 40,000 sq ft of operating space and new shipping and manufacturing facilities. Growth of demand for electric-weld tubing, hot-dip galvanized,

POLLOCK



ENGINEERING



HOP FABRICATION



FIELD ERECTION

Blast furnace **STEEL WORK**

POLLOCK

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN · OHIO

STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAB CARS · INGEST MOLD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES



Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty-five years is available to you in planning your new projects.

ROLOCK

FABRICATED

ALLOYS

HEAT AND CORROSION
RESISTANT



*Loose joints
that beat
stiff competition*

When you are heat-treating metal parts at the extremely high temperature of 2350° F . . . followed by a brine quench . . . basket construction is vitally important.

In this instance, a large auto manufacturer asked Roloek engineers for a quantity of basket assemblies that would withstand the heat and shock of martempering auto parts . . . with the greatest resistance to warping.

The answer was 18"-dia., 7½" deep Inconel baskets of 26 lbs. each. They were fabricated from ½"-dia. rod threaded thru flat bar and held in place by washers welded to the ends of the bar to form a loose jointed carrier . . . to take expansion and contraction without damage. A 4-mesh .080 wire disc is placed loosely in the bottom of the baskets.

There are many similar operations where loose joints will greatly extend basket life, reducing hourly costs . . . reflected in competitive quotations. Put us on the spot for solving heat-treating problems. We like it!

**SEND FOR CATALOG B-8 (HEAT TREATING)
ON B-9 (CORROSION RESISTANT)**

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ROLOCK INC. • 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

1RL54B



Wire Averts Broken Head

Wire mesh mat protects motorists at Carrolls Point, Wash., from falling rocks. Mat is supported by ¾-in. cables anchored on top of the slope.

spurred the modernization program.



ASSOCIATIONS

Adm. Paul F. Lee, USN ret., received the 1954 Edward P. Connel award of American Gear Manufacturers Association, Pittsburgh. Admiral Lee is vice president of Gibbs & Cox Inc., New York, naval architects and marine engineers. The association also announced the appointment of Gerald L. Scott as staff engineer.

Charles W. Trout, vice president and director of sales of Oneida Products Corp., Canastota, N. Y., was re-elected president of School Bus Body Manufacturers' Association, New York.

American Leather Belting Association changed its corporate name to National Industrial Leather Association. The association's office remains at 320 Broadway, New York 7.

Ten \$1000 scholarships will be awarded in 1954 by American Institute of Steel Construction, New York. To be eligible, students must be nominated by one of the

CLARK CRANE CONTROLS



OVERHEAD BRIDGE



COAL OR ORE BRIDGE



GANTRY CRANES



FLOATING CRANE

BETTER PERFORMANCE • LESS MAINTENANCE • GREATER SAFETY — *for any type of crane*

Of the many outstanding performance, maintenance and safety features built into CLARK Crane Controls, three are especially important:

1. The VARI-TIME PRINCIPLE. Smooth, rapid "definite-time" acceleration is achieved by the famous CLARK VARI-TIME core, guaranteed trouble-free for the life of the equipment. This is built as an integral part of the "RT" contactor for the ultimate in simplicity, or furnished with the "VT" relay—a relay built like a contactor. It greatly simplifies the circuits.
2. The CLARK Plugging Relay used on the Bridge and Trolley Control is completely foolproof, and cannot get out of adjustment. It prevents equipment abuse and eliminates needless use of the foot brake.
3. The CLARK Hoist Control features a circuit designed and interlocked to prevent opening of the armature-series-field circuit for protection during lowering.

Many additional features contribute to fast, dependable performance and consistent, trouble-free service.

If you have a crane control problem, consult your nearest CLARK representative or write us direct.

Typical CLARK Crane Hoist Control Panel.



THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

NEW ADDRESSES

A. W. Leet & Associates Inc., Michigan sales representative for Mercury Mfg. Co., Chicago, materials handling equipmentmaker, moved to 16856 Meyers Rd., Detroit 35.

Glassheat of Canada Ltd., Toronto, Ont., manufacturer of radiant heating units, consolidated its operations in a new factory and office building at 1603 Queensway.

The Philadelphia office of Brown & Sharpe Mfg. Co., Providence, R. I., machinery and tool manufacturer, is now at 7 Bala Ave., Bala-Cynwyd, Pa.

Struthers-Dunn Inc., relay manufacturer, moved from Philadelphia to Lambs Road, Pitman, N. J.

Consolidated Engineering Corp., Pasadena, Calif., instrumentmaker, moved the southeastern regional office of its subsidiary, CEC Instruments Inc., from Washington to 3224 Peachtree Rd., Atlanta.

The New York executive offices of Luria Brothers & Co. Inc., are now at 99 Park Ave. The offices will be shared by Livingston & Southard, the company's import and export division.

Steel Plate Fabricators Association moved its office to 79 W. Monroe St., Chicago 3.



REPRESENTATIVES

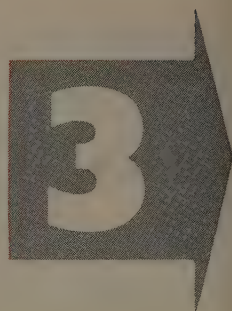
Reynolds Metals Co., Louisville, named as distributors American Alloys Corp., Kansas City, Mo., and Bridgeport Brass Co., Cleveland. American Alloys will stock aluminum pig and ingot in standard and special analysis alloys, and Bridgeport Brass will stock aluminum wire, rod and bar (screw machine products) in standard alloys and sizes.

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed Hubbell Metals Inc. distributor for aluminum products in the St. Louis, Kansas City and Indianapolis trading areas.



Just Like Grandma Used To Have

When bricklayers at Armco Steel Corp.'s Butler, Pa., plant put a new roof on an electric furnace, grandma would feel right at home. Armco uses blackstrap molasses as a bonding material; the sticky cane juice fuses bricks together without slipping. It takes two buckets of molasses to build each new roof, and the company uses about two barrels per year. It's also good for patching



STEEL's 1954 Management Series . . .

The editors of STEEL herewith present the third in their ten-part series, Program for Management for 1954. The complete list:

1. Now You Have To Sell
(Feb. 22, p. 91)
2. Build Better Bosses
(Mar. 22, p. 81)
3. Automation—How Far Should You Go?
4. Regularizing Production, Employment
5. Distribution—Integration Needed
6. Distribution—Training Personnel
7. Distribution—Transportation
8. Product Diversification
9. Foremen—Bridge to More Efficiency
10. Product Design



Automation . . .

How Far Should You Go?

You can automate virtually any production or procedures function—if you can justify it economically. Question is not “should you?” but “to what degree?”

AUTOMATION is glamorously stereotyped as the flesh and blood of the “second industrial revolution.” But it is neither revolutionary by nature nor distinct from mechanization, the instrument of the only industrial revolution to date.

Automation is simply the natural evolution of the growing trend toward more efficient operation, a trend that is being shaped to meet a changing economic picture.

For the first time in some 150 years, metalworking management is faced with a market that is not stimulated by war, rearmament or unmet consumer demand. Low production costs are a must if industry is

to operate at a profit, and automation is part of the answer.

What Is It?—Like the concept of “paradise,” definitions vary with the individual. To the electronics engineer, it implies a completely closed-loop system of controls, focused on the basic concept of feed back. To instrument specialists, it is instrumentation control. To some research men, it centers on the design and utilization of electronic computers. To many engineers, it simply implies automatic handling.

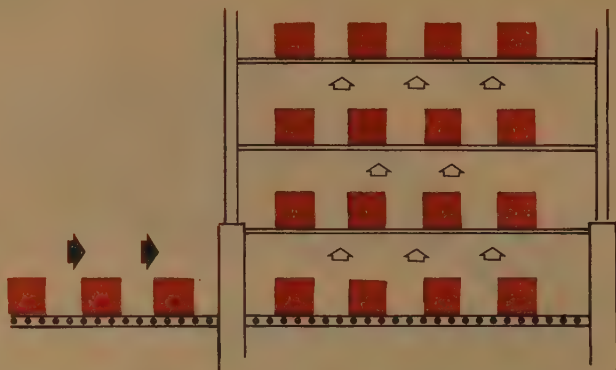
Actually, much of industry understands automation as more encompassing than any of the “specialists” do. Including all the narrower concepts, the majority view

sees it as the automatic processing of any product in procedures, production, handling and distribution.

The Start—The term as it is known in industry today originated in the automobile industry. It was coined to describe the automatic transfer of a workpiece from one operation to another, and the automatic performance of succeeding operations. Best known, most widely publicized examples will include Ford Motor Co.’s Cleveland engine plant, the Rockford ordnance plant and Ford’s Buffalo stamping plant.

The name, however, is newer than the idea. About 164 years ago a mill near Philadelphia automatically processed grain into flour with no human labor involved. As a matter of fact the commonplace automatic multi-spindle screw machine incorporates the essence of automation when it automatically transfers the workpiece through a sequence of stations and operations.

By Steps—Application of automation is a matter of degree. Some



Banking

DOWNTIME is perhaps the most critical problem on automated transfer lines. Some of it is unavoidable, but its minimization is the key to economic production.

Problem becomes compounded on automation lines. Each machine is linked to and dependent on the continuing performance of the rest of the machines. As each separate unit or section is shut down, all others become inoperative.

So, for example, in a machining line with five units (each of which must be stopped 15 minutes a day for tool change) the whole line has an accumulated downtime of 75 minutes a day. At a production rate of 2 parts a minute, line will lose 150 parts in each day's run.

If work parts could be stored between machines and automatically put into or taken from the storage as needed, it would be possible to shut down any one machine for tool change while the remainder of the line continues to operate.

Here's how: In a line rated at 2 parts a minute, workpieces move from unit A to B to C. When unit B is stopped, unit A continues to produce, but the parts are automatically directed into a banking area. Unit C also continues to work, drawing parts from a previously filled parts bank between B and C. If B must be down 15 minutes for tool change, both banks must hold a minimum of 30 parts.

Going back to the machining example, accumulated line downtime for the day will be just 15 minutes (instead of 75 with no banking), assuming that no two machine units are down at the same time. Loss will be 30 instead of 150 parts a day.

You can bank several ways. One is to allow a sufficiently long connecting link between machines to store the required number (in the example, 30) of parts. Space required for this is often the prohibiting factor.

Another device is shown in the above illustration. Unit is essentially a multi-tiered elevator. Parts are conveyed to one level or tier; when it is filled, a switch is tripped and the elevator moves up one tier.

Then parts may be automatically taken off the bank and put back into the line. In the drawing, parts can be put on from the left and taken off to the right. Bank could be mounted right in the line. If it is more expedient to place the bank at right angles to the line, parts can be taken off to the left.

Banking systems would be used only when an adjacent machine is down. Otherwise, parts bypass the bank completely and move directly through the line.

production operations, such as surface cleaning and finishing, have been automated as far as handling is concerned for a number of years.

Historically, the chemical industry, many bottling and canning plants, the food processing industries and others have accepted the principles of automation as everyday production techniques. Several reasons, the advance from "doing it by machine" to "doing it automatically by machine" have evolved slower in metalworking than in some of these other fields.

Holdup—It simply hasn't been needed—that's the reason for the slower start in the metalworking industry. Automation comes into the picture only when people can't do the job well enough, fast enough or cheap enough.

So far, in most metalworking jobs, people have been able to keep up with demand. Now, however, quality, quantity or cost demands have changed and automation comes into the picture as the only solution.

Basic Need—The starting point for automation goes back beyond design and purchase of equipment for a job. It starts as an attitude in the minds of management.

Conversion from hand operation to an automatic process has one fundamental requirement—the change must be approached from a completely new angle; it must involve *rethinking*.

Automation is not simply doing by machine what has been done by hand. Mechanical duplication of manual techniques and performance can result in a Rube Goldberg device that might be spectacularly expensive and entirely inefficient.

Matter of Dollars—Automation is essentially an economic consideration—here is where the rethinking begins. Questions must be asked: "Does our market justify the capital investment for automation, demand higher production rates and/or lower unit costs? 'Can we produce this product differently to make automation economical or should we redesign the product itself for automation?'"

Redesign may turn out to be nothing more than standardization. When the same product is made in several sizes or models, standardization on several components

make it practical to go into high production on these component parts, where it would not have been economically justified to do before.

A good example is in the automotive industry, where there is an extensive overlap of bodies through a complete line of seven or eight models.

How Far?

Factors influencing degree of automation that can be applied in any given case are: Available capital, present and proposed production equipment and capacities (including length of production run and frequency of model change), nature of the workpiece and of the operations to be performed, available personnel and plant size and layout.

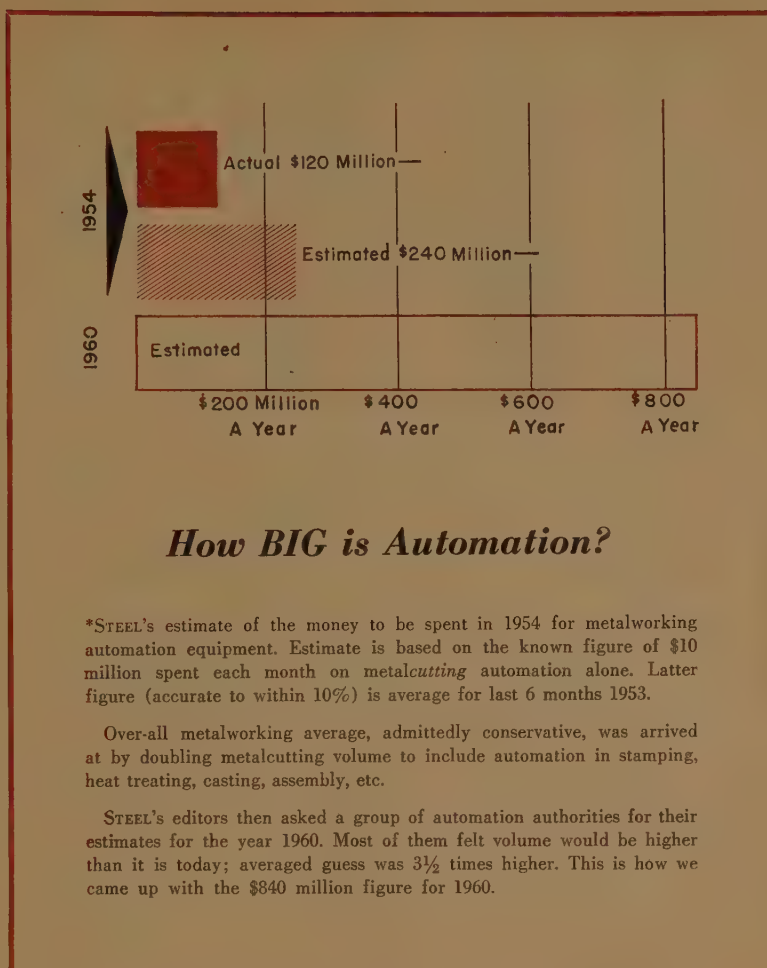
Capital—The money you have to spend will naturally determine the extent to which you can change from the conventional methods of your present production setup. It will in some cases, preclude the use of automation. On the other hand, it will often be the deciding factor in favor of automation.

There is no rule of thumb for determining the cost of an automated process or a segment of that process. Simple automation, as the incorporated into an automated, multi-spindle screw machine, is most often thought of as a feature of the machine, having no separate cost. Costs of standardized, dial-type machines, hopper feed, automatic welders, etc. are generally established, but special installations must always be considered on an individual basis.

Right Way—It is often practical to automate only part of the whole process. Automating 80 or 90 per cent may offer substantial savings in manufacturing costs and may pay for itself.

On the other hand, the cost of automating the remaining 10 or 20 per cent of the handling may prohibit the whole scheme.

Cheapest—As E. W. Franz, secretary, May-Fran Engineering Inc., Cleveland points out, automation may be the cheapest way to boost production. He cites an example where automatic chip disposal systems on five machines de-



How BIG is Automation?

*STEEL's estimate of the money to be spent in 1954 for metalworking automation equipment. Estimate is based on the known figure of \$10 million spent each month on metalcutting automation alone. Latter figure (accurate to within 10%) is average for last 6 months 1953.

Over-all metalworking average, admittedly conservative, was arrived at by doubling metalcutting volume to include automation in stamping, heat treating, casting, assembly, etc.

STEEL's editors then asked a group of automation authorities for their estimates for the year 1960. Most of them felt volume would be higher than it is today; averaged guess was $3\frac{1}{2}$ times higher. This is how we came up with the \$840 million figure for 1960.

creased downtime. Devices cost considerably less than a sixth machine, which would have been necessary to get the same increase in production.

Small, powered conveyor units connecting punch presses also raised the productivity of the line—and at an initial investment far less than that required for additional press capacity.

As shown in the accompanying illustration, Ralph E. Cross, executive vice president, Cross Co., Detroit, points out that initial investment is not necessarily an indicator of final cost. He says:

"The choice of the best process is accomplished by comparing the merits of several proposed plans of operation over a one-year period. Each proposed plan must take into account all factors of the company's profit, including sales

income, material, labor, factory expenses, administrative expenses, interest and income taxes."

Production Plans—It is improbable that a highly automated process will ever be used to make a one-of-a-kind type product. Cost of conversion from one job to another makes this impossible. Production requirements must be sufficiently large to justify continuous production over a reasonable length of time.

Notable exceptions to this are the tape or punched-card systems of machine control, such as the milling machine at Massachusetts Institute of Technology. They are still too expensive to be generally practical, but continuing development promises to make automation in the job shop a paying proposition.

Convertible—While many auto-



No Red Flag

PROBLEM of employee and union objection to automation is usually exaggerated. Often the issue never is brought up.

At Ajax Mfg. Corp., Detroit, executives last year decided to replace their batch-plating setup with a highly-automatic plating line. It involved about 12 operators on the old line. New line would require only 3 men to do the job.

M. K. Pitts, executive vice president, points out that in their plant, as in many others, it was not a question of firing, but simply that of raising the productivity per man. While automation requires fewer operators, more are used in maintenance and in inspection. What operators once viewed as an undesirable job can now be done in better working conditions with less worker effort.

For other small plants embarking on an automation program, Mr. Pitts recommends: "Don't raise the issue with the workers or the union unless it raises itself. You may be creating suspicion or doubt where none actually exists. As the questions are raised, answer them as best you can. One word of warning—don't look at automation as if it were a device for cutting your working force in half. More often you'll need all the men you have, and sometimes more. Success of automation is not in personnel cutting but in raising the productivity per worker, and in raising the quality and uniformity of the end product.

mation setups are virtually single-purpose, many can be readily converted to conform to different part sizes or to model changes. This is even more easily done where only the transfer part of the process is automated, as in connecting conveyors.

Double Duty—A large, transfer-type metalcutting unit that will machine either one of two automotive transmission housings is under construction. Housings have a common face—the one attached to the engine. Locating on this face,

the machine will automatically perform its sequence of operations as prescribed for that particular housing.

At the station one, a gaging device checks the part and tells the machine which of the two pieces is coming. Proper tooling is automatically established. The two parts may run simultaneously in any order.

Standardization — Equipment builders are continually redesigning for increased versatility. They have standardized many of their

beds, bases, columns, etc., which simplifies regrouping of units for a model size change.

Workpiece and Operations — Shape and size of the part directly affect the ease of converting to automation. Small parts often lend themselves to hopper feeding. Parts with simple contours are easiest to transfer and are generally easiest to locate and position.

Here's where redesign may pay off: The addition of locating points or clamping "handles" can greatly reduce the complexity of the automatic equipment. It is essential that no design be considered final until it has been thoroughly investigated for in-process simplification.

Working Conditions — Cost of automation varies with the operation performed. In plating, heat treating, etc., a simple conveyor (with the possible addition of moving devices) often will do the job. There is no requirement for positioning or locating.

In other operations, parts must be accurately located and clamped. The cost of this alone may preclude your going to full automation. Welding, assembly, machining and forming are examples of operations where workpiece manipulation is a key factor to automation performance.

Personnel — Management should not regard automation as a device to reduce the total working force. By continually stressing the advantage, employers are setting themselves up for labor resistance to automation per se.

Automation should be regarded as a process that raises productivity per worker, improves working conditions, lowers the product cost per part and improves quality and uniformity of the product.

The labor issue has caused little trouble. In spite of occasional union criticism of mechanization and automation, labor leaders have not interfered. Martin P. Durlacher, former Secretary of Labor, said: "The challenge to us in America today is to increase inventions, to stimulate scientific progress and to raise still higher the standards of physical well-being."

Inside Shift—Data will vary with

the installation, but generally total employment will be about the same before and after automation. There will be a transfer of some workers to the plant. While requirements for operating personnel are generally reduced, the need for supervisory, maintenance and servicing personnel is increased. Downtime is a problem in any production setup, but when production is increased by the automatic process, cost of downtime is considerably magnified.

The automatic production line must be kept in operation. Much of the downtime can be scheduled in the day's production run. For example, hydraulic, electric or mechanical checks, tool change and other routine activities can be anticipated. Where it's appropriate, automatic banking of work between stations will preclude shutting down the entire line for each item.

Some Help—While the maintenance man must be well trained, the equipment makers are helping to simplify his job. W. F. & John Barnes Co., Rockford, Ill., for example, believes that one of the soundest approaches to automation is through maintenance simplification.

This company is discussing the use of electric control panels consisting of sealed package units. When trouble occurs at any station on the line, the maintenance man can go to the section of the panel that controls the station. By

a system of simple and rapid checks (perhaps even using indicator lights), he would be able to detect the faulty unit. He would simply pull out the complete unit and replace it with a new one. Used unit could be returned to the equipment builder on a trade-in basis or repaired at the plant. Trouble shooting could be cut from hours to a few minutes.

Overdone—Dangers of excessive maintenance costs are overrated, experts say. Much of the routine preventive measures can be built into the machine, i.e. automatic lubrication.

Plant Layout—Automation will help management use available floor space more efficiently. Dr. David G. Osborn, professor, University of Chicago, says, "Automation increases output per employee and reduces the plant space requirement. The average space reduction is around 50 per cent."

With limited manufacturing space, automation is probably the best single means of increasing output.

The Gem—In spite of increased productivity per worker and resultant savings, improved product quality at lower cost is probably the greatest single contribution that automation offers. Human factor, always a variable, is virtually eliminated from the production equation.

Time cycles can be made to repeat within a fraction of a second. Physical dimensions on a part can

be reproduced accurately to within 0.001-inch in many operations. Most important, this accuracy and reproducibility are available at high production rates.

Consider this: "How much is it worth to me to reduce scrap and salvage $\frac{1}{3}$ to $\frac{1}{2}$ its present amount?" Discussing the salvage problem, R. W. Billingham, W. F. & John Barnes, states: "In many cases, salvage of a part merely consists of re-running it through the cycle. For example, if a drill should break in a casting, the operator can simply extract the broken segment of the drill, and then put the whole casting back through the cycle of the machine. Because of accurate location of the part relative to the cutters, light cuts due to the reworking are virtually insignificant."

Summing Up—Everett M. Hicks, vice president and manager of the Grinding Machine Division, Norton Co., Worcester, Mass., told the ASME that management must ask itself several questions:

"Have we selected the job which promises the greatest possibility of savings? Is the job one with a relatively high labor cost? What is the situation as to product design stability? Has the proposed equipment been studied for ease of maintenance and changeover flexibility for design changes when they occur? Have we skilled mechanical staff required to maintain automatic equipment or can it be obtained readily? Has labor ac-

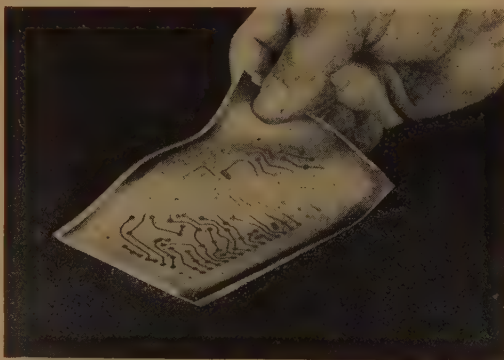


Automated Press Feeding

RAW MATERIAL comes in on one side of Ford's Buffalo stamping plant, goes down 19 major press lines into assembly and from there to shipping on the other side of the building. Drives for the major presses are in the basement. Automation devices are operated by air cylinders through limit switches. As long as the operator keeps the electrical circuit closed, photo, this stamping press and automation system function without pause to load, stamp and unload automotive parts.

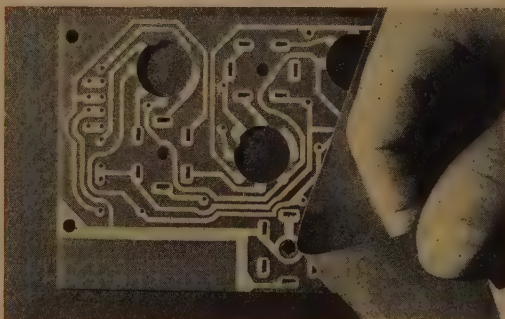
Product Redesign

MOST EFFICIENT use of automation sometimes necessitates basic redesign to the product. Automatic assembly of electronic components would require highly complicated machines and would be virtually impractical. Printed circuits are the answer to this problem—a case of complete change of the nature of the product to permit automatic operation. New developments in this field will bring the cost of electronic equipment within the financial reach of industry, and will eventually result in broad application of electronics to automation control.



Eastman Kodak Co.

The circuit above is printed on a bit of glass-fiber cloth. It was made by: 1. Laminating a sheet of copper foil over the cloth, 2. coating a light-sensitive acid resist over the foil, 3. exposing to light through a photographic negative of a drawing of the circuit, 4. washing away the resist where the opaque areas of the negative prevented it from hardening and 5. etching away the foil where the remaining resist did not protect it.



Rubber and Asbestos Corp.

This laminated printed circuit requires only two production steps on the part of the base laminator. First the adhesive-coated copper sheet is laid on the base of impregnated paper or previously formed laminate. Next it is set in a heated press for cutting and final lamination. Bond strength is 25 to 35 pounds per inch after being bathed in solder at 235° C. Sample copper sheet is in foreground; it's available in 1 or 2 ounce weights.

ceptance of the proposed equipment been determined? Has downtime for tool maintenance been given sufficient consideration? And above all—will it pay?"

Where Will It Go?

Much attention has been directed to the application of automation in machining and in metal forming. While these two have led the way in metalworking, several other areas of manufacture show great potential.

One of the ripest spots for automation is the foundry. W. E. Dougherty, consulting engineer, Giffels & Vallet Inc., Detroit, points out, "The foundry, with the exception of certain core finishing operations, core setting and some knockout and cleaning operations, need not be concerned particularly with the shape of the pieces produced." Generally, core boxes, driers and flasks can have any desired external shape.

Pipe fittings, cylinder heads, wheels, ash trays and bevel gears could be cast using the same machines and equipment, as long as the same surfaces and projections are kept on the boxes, flasks and other containers.

Crane Co., Chicago, is now using a completely automatic cope and drag molding system. It produces 1800 completed green sand molds every 8 hours. Four men are needed. One sets cores and another removes the cores. The other two supervise the pushbutton units. In addition, there is one man pouring, one at the shakeout and one or two on relief.

Certainly one of the country's foundry show places, Ford's Cleveland foundry is highly automated in many areas. Handling of the sand is fully automatic. Other jobs are highly mechanized with many of their functions handled automatically.

Assembly—This is another of the fields in which automation can be used to a much greater degree. Assembly of many small components, as in some appliances, is a tedious, time-consuming job. Partial automation will offer cost savings almost beyond comprehension.

Circuit Magic—This, too, may call for a completely new concept

the product. Automatic manufacture of electronic and electric circuits is a good example. Project Tinkertoy, sponsored by the Navy's Bureau of Aeronautics, produces electronic circuits, using ceramic wafers as building blocks. Electronic components, such as resistors, are mounted on separate carriers and are held together by resistors. This method of assembling circuits (it's done by machine) is roughly 40 per cent cheaper than conventional methods.

And More—Welding, heat treating, cleaning and finishing, gaging, handling and packaging also fall into the easily-automated category. Another application, already in use, is the electronic weighing and packaging of bulk products. There is no doubt that it could be used for screw machine products or other small items packaged by count or weight. Closed-loop control measures the weight assigned to the package and adjusts the carrier accordingly. Systems are filling up to 90 packages a minute.

How Far Will It Go?

Most automation authorities agree it is possible to automate any production process, to accomplish virtually any production action automatically—if it can be justified economically.

The practical application of relatively low-cost electronic controlling systems to automation control will open new vistas. Apparently there is no limit to the future of industry. The ultimate, of course, is the automatic factory.

In the automatic factory, completely automatic production lines will perform according to a schedule supplied by computers. These computers also will solve the management problems of sales figures, orders, inventory reports, etc., and will give immediate answers.

Output of the line would be recorded and re-entered into the computers for adjustment of the subsequent operations.

Raw material could be automatically taken from the storage area assigned to a line in an established order, processed through production and assembly into packaging and onto the loading dock.

In warehousing, an example of

Cost vs. Pay

AS IS TRUE in the purchase of all production equipment, the initial cost of automation doesn't tell the whole story. This form shows how the highest first cost can be translated into long-run economy. Figures, of course, will vary with the size of the installation, the nature of the job, etc. Similar calculations should be made for all automation proposals.

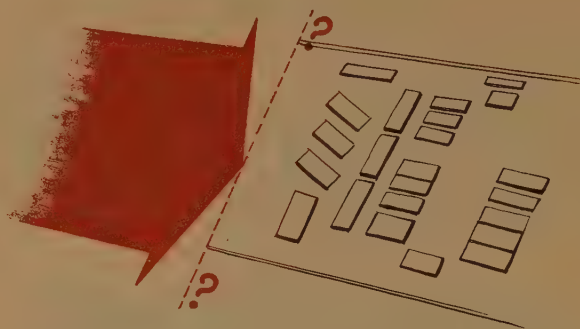
PROJECTED PROFIT AND LOSS STATEMENT FOR THREE PLANS OF PRODUCING OIL PUMP BODIES

Production—1,250,000 pieces per year

Estimated life of process—8 years

	PLAN 1	PLAN 2	PLAN 3
INVESTMENT REQUIRED	None	1,071,000	850,000
SALES			
1,250,000 Bodies @ 0.82 each ..	1,025,000	1,025,000	1,025,000
COST OF SALES			
Material	396,000	396,000	396,000
Subcontracting	None	None	None
Direct Labor	187,268	53,328	79,592
Rework	1,500	495	825
Setup & Tool Change	7,434	3,638	5,139
Supervision	20,250	7,000	7,000
Labor Fringes	43,290	12,892	18,511
Floor Space	4,435	5,443	4,760
Power	3,475	6,000	5,100
Taxes	5,000	21,420	17,000
Insurance	1,791	3,750	2,975
Perishable Tools	27,050	18,750	20,100
Supplies	9,200	3,720	3,820
Scrap	26,060	13,480	18,300
Tool Grinding	13,320	7,750	9,630
Machine Repair	15,500	5,100	3,750
Lubrication	3,550	1,250	2,500
Depreciation	None	93,713	74,375
Miscellaneous	28,090	7,999	11,938
	793,213	661,728	681,315
GROSS PROFIT	231,787	363,270	343,685
SELLING EXPENSE	66,625	66,625	66,625
ADMINISTRATIVE EXPENSE	43,627	36,395	37,472
INTEREST	None	None	None
PROFIT BEFORE TAX	121,535	260,252	239,588
ESTIMATE FOR FEDERAL INCOME TAX	60,767	130,126	119,794
NET PROFIT	60,768	130,126	119,794

Cross Co.



How Far Should You Go?

THERE IS NO hard and fast rule for deciding where you belong in the automation picture. The degree to which you can automate your plant of parts, therefore, must be handled on an individual basis. Here are some factors which will help you find out "how far you should go."

AVAILABLE CAPITAL—

Warning, don't let the initial cost stop you. Investment must be figured over the long run, and it should be compared with return.

PERSONNEL—

Evaluate your employees in terms of their part in the automation scheme. Much of your direct labor may be routed into maintenance. Be sure you can successfully operate and maintain the system you install.

SALES REQUIREMENTS—

If you're going into automation to boost production, check to see if the proposed system meets your needs. If it falls short, you haven't solved your problem, and if it over-produces your requirements, you will be booking expensive machine idle time.

WORKPIECE GEOGRAPHY—

Consider the application of automation to your product as it now stands. Also consider re-design of the part to facilitate automatic processing. Standardization of design can enhance the possibilities of creating parts with long production runs.

PLANT LAYOUT—

Automation will increase your plant production per square foot. Consider the advisability of shifting some or all of your present equipment to fit the proposed system.

what can be done is at Hickory Mfg. Co., Lyons, N. Y. Chutes holding the merchandise are operated by remote-control code machines. The operator punches keys on the machine to denote type and quantity desired. Items are released from the chutes, fall onto a conveyor belt and are carried to a packaging and shipping area. An entire order can be processed in the time it takes the operator to punch the keys.

And the Workers? — Automating factories will not be completely workerless factories. Maintenance and supervisory personnel in a fully automatic plant will still be numerous.

But this dream factory is still below the dip in the metalworking horizon. As Roger W. Merrill of Battelle Memorial Institute, Columbus, O., puts it:

"For most manufacturing plants, automation will not spring up overnight; rather, it will evolve as improvements are made in the instruments, computers and servo mechanisms. This will occur process-by-process rather than on a plant-wide basis."

Long before the automatic factory arrives, however, much of the industrial process will be automated to a degree—from the automatic screw machine, through conveyor-linked standard machines to processes right up to the tape controlled transfer lines.

Management's decision today is how far do we go? We have passed the "should we?" stage.

The answer to this question will always vary from one job to the next, from one plant to the next. But, certainly, no revision of production plans, no purchase of new equipment should be established until the automation question is answered.

S. J. Hunt, secretary and administrative engineer, National Automatic Tool Co. Inc., Richmond, Ind., says:

"... the trend toward further automation will continue ... The result will be more and better goods at less money for everyone. This is an absolute fact, because it must be remembered that this equipment is bought only when the buyer knows it will make money for him."



Prime example of Salem-Brosius' furnace-engineering ability


The huge industrial furnace illustrated here attests to the superior engineering skill of Salem-Brosius. One of a few of its kind in the country, it is a pusher-type, triple-fired slab heater currently feeding the giant hot strip and sheet mills of a great steel producer. It features high capacity heating and soaking zones, heavy construction, recuperators for fuel economy, dual gas-oil fuel system, and many other advantages to assure positive, automatic control of furnace output and heating quality. *And the efficiency, economy, ease-of-operation, and trouble-free service this furnace represents are typical of all the furnaces Salem-Brosius builds.* Whether you require conventional heating or heat treating furnaces or furnaces to do an extraordinary

job, Salem-Brosius offers equipment designed, engineered, and built not merely as a furnace but as a heating machine. You can purchase these furnaces as complete installations—equipped with all controls, piping and wiring—ready to operate.

Salem-Brosius products—furnaces, forging manipulators, goggle valves, slag granulators, clay guns, charging machines, grab buckets, and special equipment—are engineered for peak performance at lowest cost, because we believe that satisfied customers are our best advertisements. Before you invest in any of these products, we suggest it will pay you to call in a Salem-Brosius engineer and let him study your problem and present a proposal.

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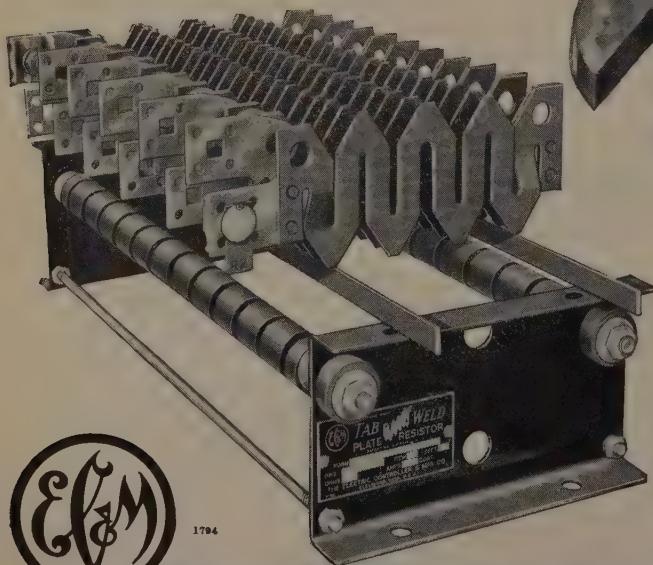
Hands Off!

EC&M TAB-WELD RESISTORS REQUIRE MINIMUM MAINTENANCE

Only EC&M TAB-WELD Plate Resistors are both bolted and welded for constant current path. Unlike other resistors, they do not require periodic tightening of clamping nuts to compensate for loss of pressure caused by alternate heating and cooling. In TAB-WELD Resistors, grids are offset and mating ends spot welded. Tap-plates are also welded into place at close intervals along the grid assembly.

This exclusive EC&M construction offers these outstanding advantages: (1) stabilized ohmic value, (2) no burning at grid-eyes or at tap-plates, (3) easy tap-shifting for best motor performance, and (4) long life with negligible service.

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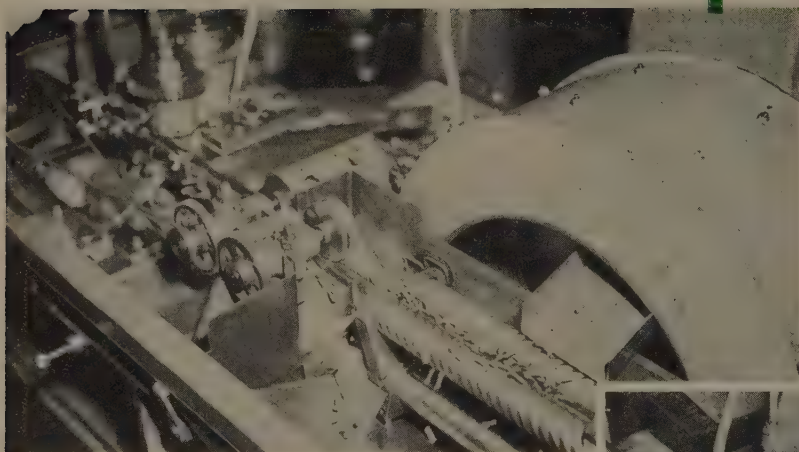
CLEVELAND 4, OHIO

without downtime. Hot-ingot conditioning is possible to a greater extent, saving soaking pit time. Most significant: Workers have received the safety togs enthusiastically and wear them without being prodded by safety management.

PLASTIC TOOLS— Industry will save about \$30 million in labor and material on plastic tools in 1954, Dr. Robert S. Aries, consulting chemical engineer, told ASTE last week in New York. He cited a case where it takes 84 days to tool up with metal to make side panels for trucks. Plastic tools for the job are turned out in 21 days at a 50 per cent economy. Others: A large aircraft company says it's saving \$2 million a year, a foundry \$4000 on each of its 50-core boxes.

SHELL MOLDING—If you prefer solvent-type release agents to water emulsions, take a look at two new silicones developed by Dow Corning Corp. F-496 contains 5 per cent solids, F-452, 50 per cent. High-viscosity silicone fluids are in mineral spirits.

NEW LAMPS— General Electric Co.'s Lamp Division is responsible for a pair of developments of considerable significance to both production and plant service people. The first, a new type of infrared lamp, will probably be seen first in industrial radiant drying and baking ovens. In two ways it's a departure from previous units: A compact tubular shape and fused translucent quartz composition. High energy concentration, plus energy over a wide range of wave lengths, promise advantages. Also significant to industrial users is a new fluorescent lamp the division says produces 35 per cent more light than its previous light sources. A new design for the base confines it to new installations.



Blanks are carried to delivery chute by vanes in the revolving hopper. Agitator rolls then position blanks and feed clearing wheels. Excess blanks return to hopper

Feed-in wheel gears, interchangeable according to blank size, keep feeder trough filled with blanks. Endless steel band conveys blanks to the notched feed dial



New Waterbury Farrel machine multiplies output of screws without sacrificing quality for speed. Design of reasonably-priced dies and feed mechanism opened the way

Planetary Thread

PLANETARY die and segment thread rolling principle, as applied to a new machine completed by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., boosts output speeds anywhere from three to fourteen times over previous machines.

Yielding from 300 to 2000 blanks per minute, depending on blank size, materials and feeding characteristics, the machine's capacity ranges from a number 6 screw to $\frac{1}{4}$ -inch diameter; and the lengths range from $\frac{1}{4}$ to 3 inches with a maximum thread length of 2 inches.

Limitations—Based on a design patented by Victor H. Fray, New Zealand, the machine is primarily for production runs of 100,000 or over and applicable mainly for machine screws requiring Class 2 threads, although Class 3 are possible. Quality is equivalent to that obtained on flat die machines. Dies have not yet been commercially developed for sheet metal or gimlet pointed screws, but an early solution of this problem is foreseen.

Stainless steels have not yet been run, nor have hex-cap screws, carriage bolts and the like. The sim-

plest blanks are standard, round button, pan truss and flat heads of medium lengths. Long blanks run somewhat slower due to arranging problems in feeding.

Not a New Idea — While most thread rolling is done with flat reciprocating and two or three round cylindrical dies, the idea of planetary dies is not a new one. Waterbury cataloged such a machine, patented, in 1888 and hoppers were developed for them in the 1890's. Real development headaches lay in the manufacture of the dies at reasonable prices and devising a feed to keep up with the phenom-

operating speeds possible.

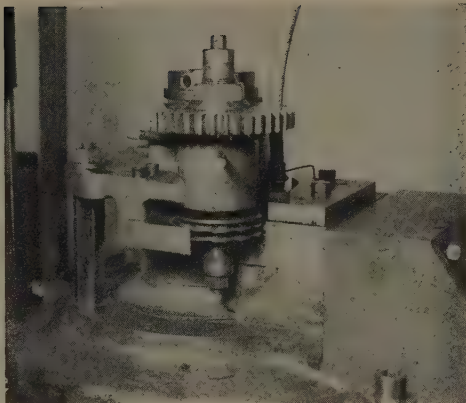
Like flat reciprocating dies, flat dies are placed under or over the cylindrical die to locate the threads of blanks not rolled to the head. Standard die faces are $1\frac{1}{8}$ and 2 inches. Two segments and one cylindrical die form a set capable of rolling up to six or more million blanks as indicated in service tests.

How It Works — The feeding mechanism consists of a drum hopper, agitator or sorting rolls, clearing wheels and an endless steel conveyor belt. The whole mechanism, excepting the hopper drum, may be swung out to provide easy access to the dies and necessary timing and speed changes.

Hopper is revolved at $2\frac{1}{2}$ to 8 rpm and, like a water wheel, elevates blanks to a delivery chute which empties them over sorting rollers where the blanks are positioned shanks down between the fluted chutes. Between these rolls is the front clearing wheel, rejecting blanks not properly positioned so excess fall down an inclined chute into the hopper bowl where they may be fed over again.

Purpose of the second clearing wheel running clockwise is to assist blanks in getting properly under the closely guiding chute cover and to prevent the heads of blanks from climbing over one another.

Feed-in wheel shaft of threader in action. By changing top gears, shaft speed and feed-in rate can be adjusted. Feeder carriage can be swung out for easy access. Safety guards have been removed to show the details



Closeup of planetary thread rolling die in process of threading blanks. Coolant enters from flexible base in center. The rigid construction minimizes the shaft deflection

Die at right has rolled some 750,000 screws without visible signs of wear



Rolling . . .

Up to 2000 Blanks Per Minute

Feeder Guides—Along side of outer chute is the fast traveling steel belt which moves the blanks along quickly by contact under the heads of blanks and the shanks as well. Inner chute is the secondary guide leading up to the position of the feed-in wheel which, with proper notches, picks out the blanks from the chute and rotates them between this wheel and outer guide in between the main roll and segment die. This later is notched to admit the feed-in wheel.

For short or difficult-to-feed blanks, a spring plate or other device keeps the blanks down against the feed-in wheel so that heads are always flush with the top of the

dies or filler pieces. After passing through the planetary dies the blanks are stripped or dropped into a chute which carries them to a tote pan.

Cooling and Coolants—Various coolants have been used from pure lard oil to Cim cool the latter in 10 to 1 mixture with water. Coolant and die wash are forced between the dies by a centrifugal pump next to the base of the machine. The coolant capacity is 50 gallons. Four individual motors drive the die spindle, hopper, feed and coolant pump. All controls are centralized in a panel control box and interlocked for safety.

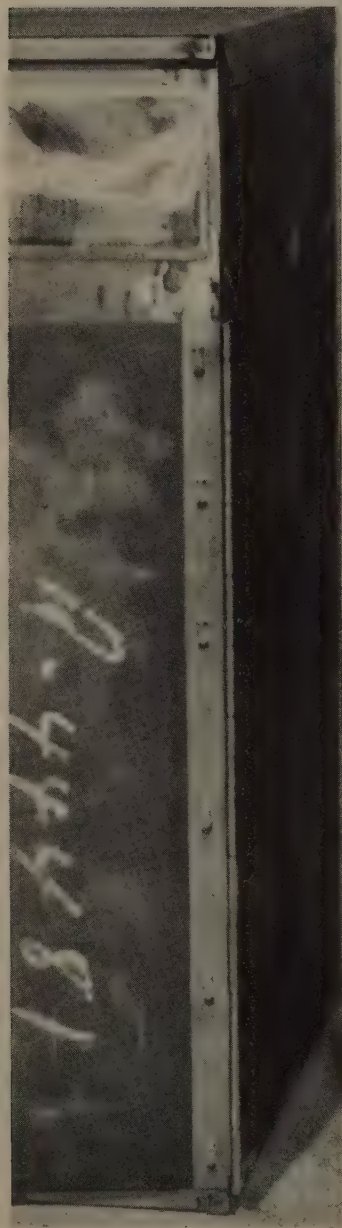
The complete change of dies, set-

up and adjustments requires about $1\frac{1}{2}$ hours. No change is required for minor differentials in length; only a pressure adjustment may be needed for different materials.

Economies — Since one machine will do the work of from 4 to 14 flat die threaders and one operator can easily take care of two machines, several economies are immediately in evidence. Operator can concentrate on a single machine more readily than on a row of machines.

With blanks rolling more times through their die path, the threads are more easily formed and the greater die life compensates for the greater cost.

Otis uses Metalace process for fastening hinges to sheet steel bank cabinet doors. Punch press at right was easily adapted to perform the operation. Photograph below shows an assembled cabinet and rectangular "laces"



Fastening Costs

TAKE A NOSE DIVE

These two sheet metal fabricators, with the help of Metalacing punches and dies, are buttoning up substantial savings in time and materials

TWO West Coast sheet metal fabricators, each a large-volume producer of consumer items, are totaling up significant savings in joining costs, thanks to a unique process. Called Metalacing, the technique involves shearing, drawing and upsetting of metal on both parts in such a way as to form a tight bond without the addition of another element.

Crockatt Engineering Co., San Francisco, holds the patents on the tools—a specially-designed punch and die set—and they have licensing agreements with manufacturers who produce and sell them.

How It Works—Actual fastening occurs when the shearing action of the punch creates a parallel double

incision in the metal sheets being worked. The strip of metal between these incisions is rammed downward, against the anvil of the die beneath the sheets and between the die's movable jaws.

There the impact spreads the depressed metal sideways, creating a permanent fastening wedge or button under the surface of the bottom sheet. Strength of the fastening, according to Crockatt officials, is comparable to rivets.

Saves Materials—One firm, the Frank Pollard Co., San Leandro, Calif., makes aluminum clothes drying poles and the flanged, tubular ground boxes in which poles rest and revolve. It was in the making of these ground boxes that

Pollard realized more than 22 per cent savings in material alone. Formerly they spot-welded two halves of the boxes together. This meant that new metal had to be used, a factor that pushed finished costs higher.

With Metalacing, Pollard production officials report they are able to use prepainted scrap metal of the same gage that is from 2 to 3 cents per pound cheaper. This cut up, they say, to the 22 per cent mentioned above.

"We also save time with Metalacing because we no longer have to pickle the ground box halves before fastening them together. Formerly oil was used as lubrication in the forming process and had to be removed prior to spot welding. Now we just take the metalaced box and pickle and paint it," report Pollard officials.

Sixty Per Cent Faster—That's the report of Otis Sheet Metal Inc., San Francisco, which uses Metalacing in the manufacture of their metal bank cabinets. "Just by installing punches and dies in our regular punch press we converted it to metal fastening duty," reports Otis president, Erik Skovgard.

Formerly hinges were riveted to cabinet doors. This meant three separate operations: Punching holes in the hinge plate, punching matching holes in the steel doors, and then inserting and flattening the rivets. Metalacing does the job in one step.

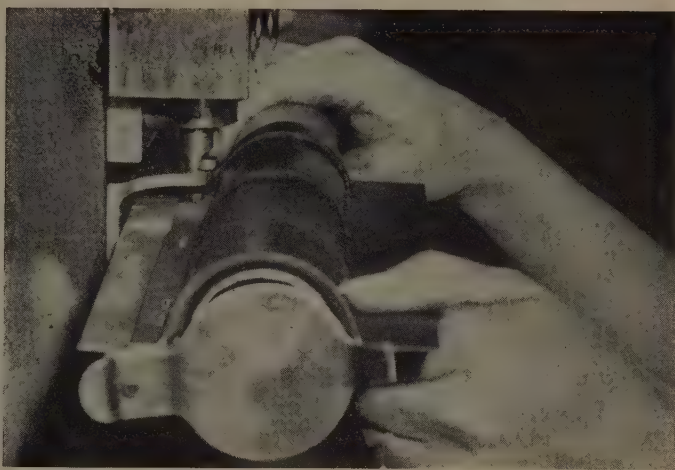
Where Metalacing proved to be 60 per cent faster than riveting in fastening 14-gage continuous steel hinge to the 11-gage sheet steel doors the method proved even faster on parts where welding was formerly used, according to Otis production men.

Size Range—Tools are available in a range of sizes that will fasten sheet metal up to $\frac{1}{4}$ inch thick. In most cases, existing hydraulic presses can be quickly adapted to fastening by insertion of the punch and die set. Best results are obtained with foot-operated presses which leave operator's hands free to handle the work.

Crockatt estimates that there are more than 270,000 presses in American industry that are suitable for Metalacing operations.

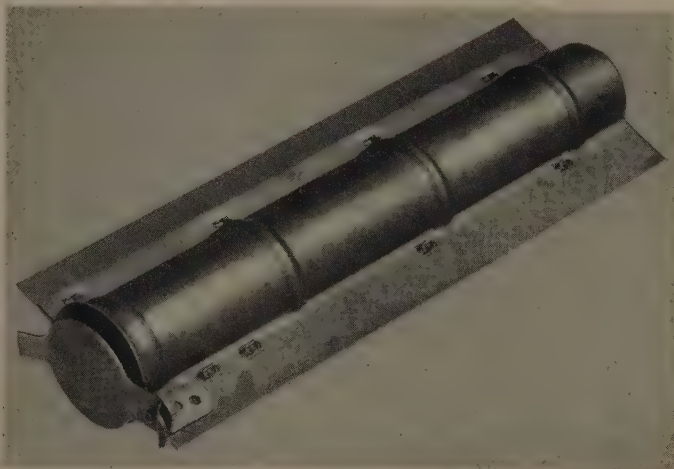


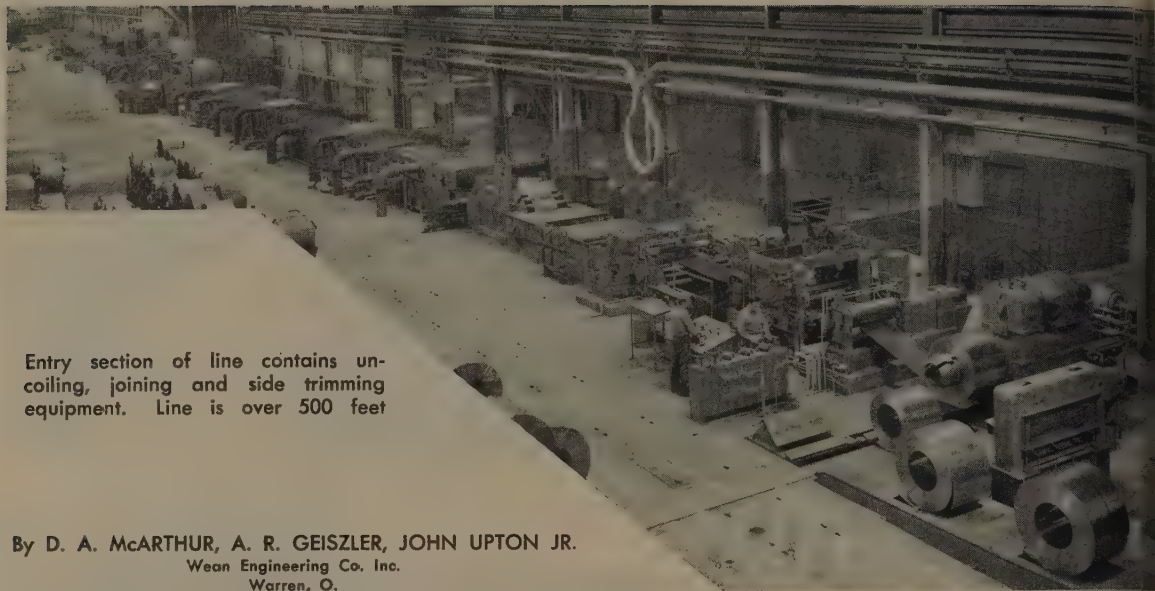
First step in assembling ground boxes at Pollard Co. is to fasten the cover flap to one half of the box



Then the operator "laces" the other half to the assembly by split-second blows along flanges of the box

Finished product looks like this. Pollard can now use cheaper, prepainted metal since they no longer weld





Entry section of line contains uncoiling, joining and side trimming equipment. Line is over 500 feet

By D. A. McARTHUR, A. R. GEISZLER, JOHN UPTON JR.
Wean Engineering Co. Inc.
Warren, O.

Continuous Galvanizing Line

DESIGN IS KEY TO SIMPLE CONTROLS

Division of line into three sections affords excellent arrangement for good control system. Close speed regulation between sections for synchronization is eliminated

PART 2

This is the second of a two-part series on this new line. Article last week described the line in detail.

DIVISION of Wheeling Steel Corp.'s continuous strip galvanizing line at Martins Ferry (entry, processing and exit sections) is an ideal arrangement for a relatively simple yet good control system. Necessity of close speed regulation between sections to maintain synchronization is eliminated.

As in all processing lines, it is essential that speed synchronization between drive motors imparting power to the strip within a section must be maintained.

Drives—All dc motors, except the one for the scrap baler, are connected to a variable voltage

system, which is further subdivided into four generators: One for the entry section; one for the processing section; one for the reel, which is transferred to the flying shear when shearing and piling; and one for the piling section.

Basic characteristic of this type line is constant torque rather than constant horsepower. Entire line speed range of 6 to 1 is obtained by armature voltage, permitting use of constant-speed, dc motors suitable for constant torque operation over the entire 6 to 1 range.

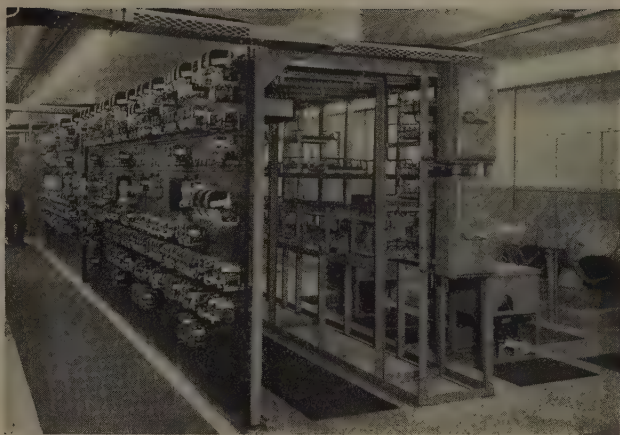
Only exceptions are the coil

holder and tension reel. Here additional motor speed range is required for coil build-down and build-up.

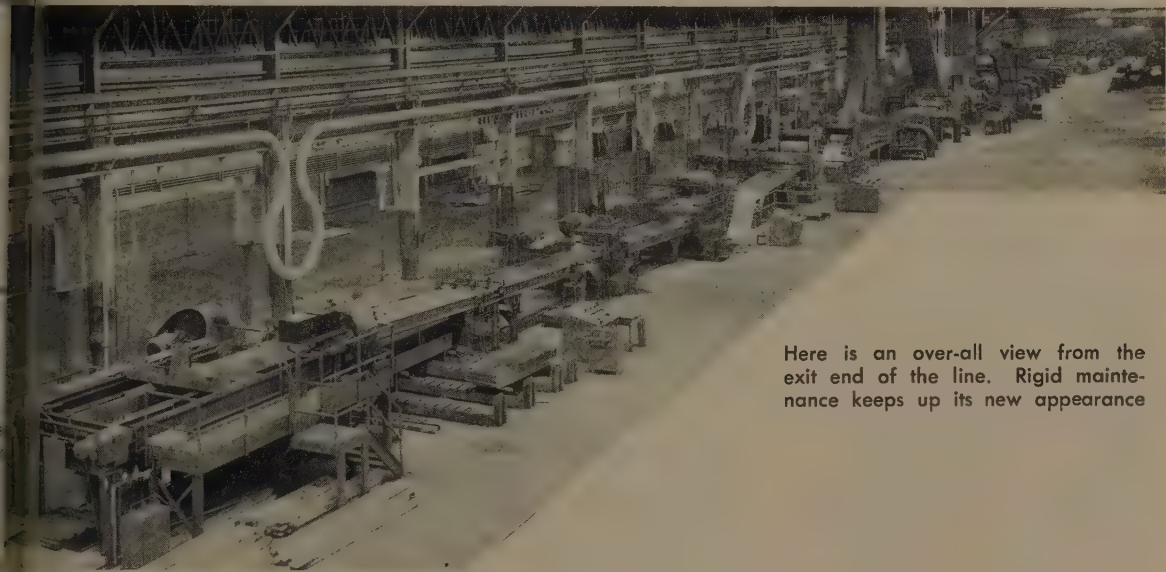
Controls—Excitation to each of the four generators is controlled by motor-operated rheostats; each incorporates a preset speed dial which automatically brings the several sections to the pre-selected speed established by the main operator with a small, preset speed rheostat on the main desk. Any slight mis-match in speed between sections, inherent in the system, is overcome by the regulating range of the photo-electric loop controls between sections.



This area includes the pot, flux drying and strip coiling equipment. The pot is heated by induction



Electrical control room is on a balcony adjacent to the line. Portion of the dc equipment can be seen



Here is an over-all view from the exit end of the line. Rigid maintenance keeps up its new appearance

Since there are two loops in the entry section, control is so arranged that the photo-electric controls of the shallow loop preceding the side trimmer operate in the field of a booster in the roller pinch roll armature circuit. Any change in the position of this loop affects the speed of the welder pinch roll and the speed at which strip is removed from the coil holder.

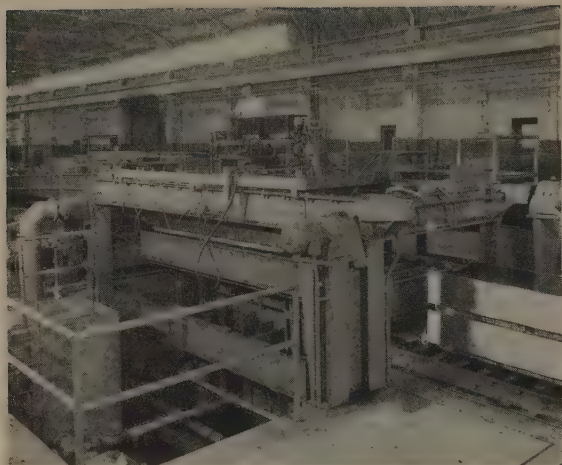
These changes are reflected as differences in tension in the strip from the coil holder; however, the tension regulator associated with the coil holder immediately adjusts the coil holder motor field

to maintain constant tension. The second loop associated with the entry section is the number one, deep strip storage pit. Since the process section is normally operated at a constant speed, the regulator for this loop operates into an auxiliary field of the entry generator to vary its bus voltage, as commanded by this loop generator.

Processing—For any strip width and gage this section is normally operated continually and at a constant speed. Since the motoring load under this condition is relatively constant, no speed regulators are incorporated; but the

process section generator has a rotating-type voltage regulator, and the main drive bridle sets the speed for this section. To avoid strip slackness, which could cause scratching and produce irregular coating weights, a tension regulator for the drag bridle maintains constant tension.

Exit—Here the section for re-coiling operates from one main generator. Its main field is controlled by a motor-driven rheostat, with the preset speed function. The generator's auxiliary field is under the photo-electric control of the number two, deep looping pit. A normal, rotating-type tension



Piles are squarely stacked by this primer piler. It includes staggering device for the piling of packs



Here a coil is being wound on the reel at the end of the line. Coil car removes completed rolls

regulator for the reel maintains uniform recoiling tension.

To assure the winding of a straight coil, a pneumatic-type, edge-positioning control unit is provided. When shearing and piling, the bridle (previously acting as a drag bridle to establish rewind tension when recoiling) now operates as a feeding unit to feed strip into a second, shallow-regulating loop. It immediately precedes the flying shear. Since this drag bridle is now motoring at a light load, the photo-electric loop controls of the shallow loop operate directly into the bridle motor field to maintain the shallow loop position.

Piling generator supplying power to several belt conveyors and the leveler is also a two-field generator. The main field is under motor-operated rheostat control, similar to the exit generator; the auxiliary field is connected into the same number two, deep looping pit, photo-electric controller as the exit generator auxiliary field. With this arrangement, the position of the loop in the number two, deep looping pit regulates the speed of all drives in the exit section; it automatically provides over-speed of this section, when the number two, deep loop pit has become partially filled because of exit section stoppage to remove a prime pack.

Others—A drive may be provided for coating rolls on the

galvanizing pot. This system would have a special, high starting torque motor connected to a special generator. Control may be arranged to give the operator complete control of coating roll speeds relative to the line speed. This drive also may be arranged to rotate the rolls at reduced speeds, when the process section of the line is stopped. This would decrease the possibility of rolls freezing in their bearings.

The pre-melt and main pots, heated by 60-cycle, multi-inductor coils, are provided with high-power, low power controls and an elaborate alarm system.

Auxiliaries—A line of this type also requires numerous ac auxiliary drives for fans, pumps, adjusting mechanisms, etc. Aggregate horsepower is about 500—not including drive motors for motor-generator sets. To control ac motors, modern enclosed control centers, with incoming line reactors to limit fault current within the control center structure, and motor feeder lines to 15,000 amps were used. Control center, in a standard, 90-inch high structure, is a panel 55 feet long.

Balcony—Controls, regulating, booster and variable voltage motor-generator sets are installed in a control balcony. Floor is at an elevation above flood level.

Main conduit runs emerge from this control balcony and run lengthwise to the line supported

on the building columns—again at a higher-than-flood level. Minimum conduit and cable are embedded in the floor.

Specials—Several other items deserve mention. First is the complete absence of fumes from surface preparation, coating or chemical treating sections of the line. All tanks have covers and fume exhaust systems, complete with fans and fume washers.

Exhausting equipment for the pot and flux tanks is constructed of stainless steel, to withstand corrosive action of some fumes. Fume exhaust systems from tanks that may contain acid are rubber lined. Success of these systems is proved by the completely clear atmosphere at all times throughout the building.

Wheeling Steel Corp.'s color code system has given the line a pleasing appearance. After several months operation, it still has its first-day look because of rigid maintenance, which includes schedule of repainting.

General contract for the line, completely installed, was placed by Wheeling with the Wean Engineering Co. Their principal subcontractors were the Westinghouse Electric Corp. for all electrical equipment and the McDowell Co. for installation. Dingle-Clark Co. and Kaighin and Hughes were subcontractors under McDowell. Ajax Engineering Corp. furnished the two induction pots.

CMP

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physicals, uniform finish,
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edges.

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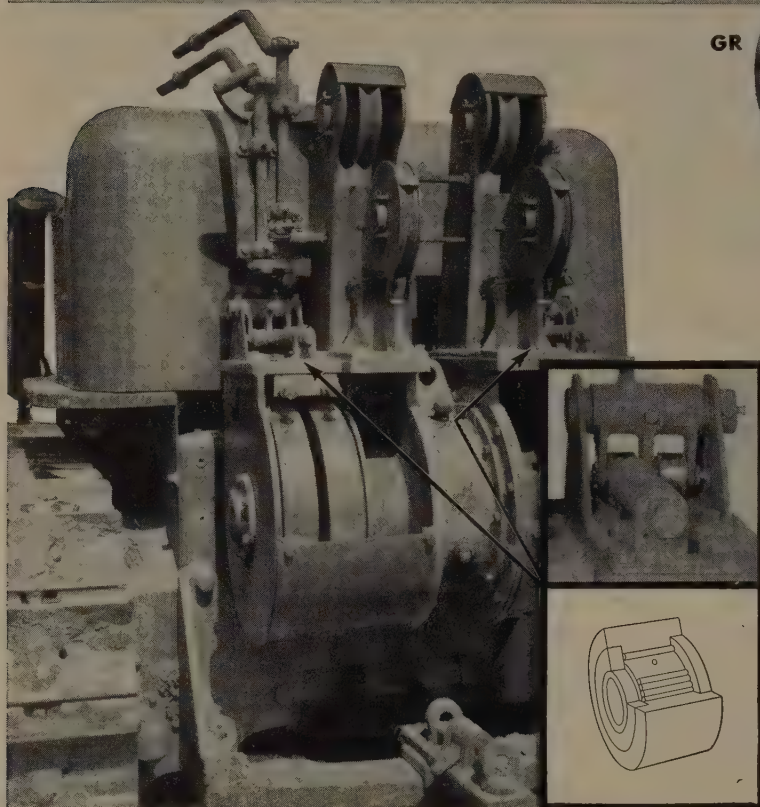
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McGILL BEARING BRIEFS



MULTIROL® CYR Bearings

HELP PROVIDE

"POSITIVE ACCURATE CABLE CONTROL"

on **Gar Wood** Cable Control Units

It takes dependable, precision bearings to achieve the "fast, accurate control" featured in Gar Wood Cable Control Units. That's why Gar Wood has standardized on Multirol CYR Bearings as cam rollers on the control arms. The Model 281 unit uses 4 CYR bearings to enable precise, frictionless adjustment of control cables on each of two drums that handle a scraper or dozer blade. CYR Bearings have a thick outer race section to withstand the heavy shock loads encountered in such cam applications.

They help make the Gar Wood Cable Control a rugged, hard-working unit that stops and starts smoothly.

Multirol CYR Bearings are built to provide longer life and greater efficiency in cam operations. They are labyrinth sealed by roller retaining end plates tightly fitted and secured to the shoulders of the inner ring. Yoke mounting is possible where desirable on shaft sizes ranging from $\frac{1}{4}$ " to $1\frac{1}{4}$ " for corresponding roller diameters of $\frac{3}{4}$ " to 4".



BEARING SELECTION GUIDE

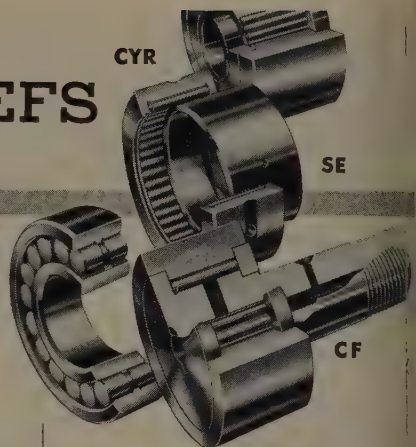
A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

GR

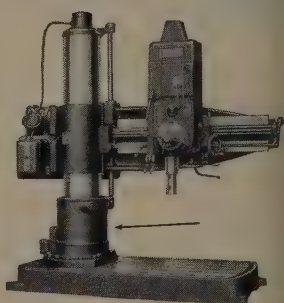
CYR

SE

CF



FOSDICK DRILL HEADS POSITIONED BY CYR BEARING



Fosdick Machine Tool Company uses Multirol CYR Bearings to provide rigid and accurate support between inner and outer columns of this Hydraulic Radial Drill. The CYR Bearings act as guide rollers between columns to provide precision positioning of the drill head.

CYR BEARINGS REDUCE FRICTION ON VALVAIR VALVES

Changing the cam roller on this Valvair 4-way cam operated valve to a Multirol CYR Bearing reduced friction on the cam plate and eliminated elongation of the hole in the cam arm. Since replacing friction type rollers with CYR Bearings, they have never had occasion to replace either the cam roller or the cam arm.



McGILL® — Precision Bearings

McGILL MANUFACTURING COMPANY, INC.
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Inactor Temperature Gage

to do the job, Argonne's device is only slightly larger than hypodermic needle

TERMOCOUPLE developed at Argonne National Laboratory, Mont, Ill., makes possible temperature measurements inside the elements of operating nuclear reactors. Measurement is possible because the device is slightly thicker than a standard hypodermic needle.

Because of its thinness, flexibility and ruggedness, it can be threaded through small and winding passageways into places which cannot be reached by conventional thermocouples.

Twice the Voltage—Temperature difference when two dissimilar metals are exposed to heat source creates electric current.

Sensitivity of a thermocouple is dependent on the highest millivoltage generated at a given temperature, and it must be reliable in indicating accurately the temperature readings during repeated temperature changes. The electromotive force generated in the Argonne-developed thermocouple is reported to be twice that developed in the more conventional industrial types.

Construction—The thermocouple construction consists mainly in insulating a thin insulated constantan wire into a small diameter inconel tube of the hypodermic needle type and drawing the tube through wire on a draw-bench. This grips and seals the wire within the tube. The inconel tube and the constantan wire, being dissimilar materials, comprise the couple components.

Fabrication of the thermocouple is completed by fusing the wire and tubing at one end. By using the wire and tube type of construction, the Argonne scientists were able to reduce the diameter of the couple; by utilizing the inconel tube which does not corrode easily, need for an over-all protective tube was eliminated.

Thermocouples which are 0.040 in. in diameter and 20 feet in length have been constructed and used by Argonne scientists to detect and record temperatures up to 1250°F.

Coming Next Week (April 19)

STEEL'S

TOOL SHOW ISSUE

- ✓ **READ**—about the tool engineer's new role on the management team
- ✓ **READ**—what the leading tool and die materials manufacturers are doing to meet the challenge of lower costs and improved performance in a Special Forum
- ✓ **READ**—about putting efficiency into the design of jigs and fixtures
- ✓ **READ**—what tool engineers and exhibitors will be doing at the ASTE show

These 21 Experts Will Report in the Special Tool and Die Materials Forum:

L. V. KLAYBOR
Allegheny Ludlum Steel Corp.

H. JAMES RENAUD
Ren-ite Plastics Inc.

G. V. LUERSSEN
Carpenter Steel Co.

K. R. BEARDSLEE
Carboloy Dept. of G.E.

G. K. SIMONDS JR.
Simonds Saw & Steel Co.

FRANK B. RACKLEY
Jessop Steel Co.

GEORGE A. ROBERTS
Vanadium-Alloys Steel Co.

ARTHUR T. CLARAGE
Columbia Tool Steel Co.

H. E. REPLOGLE
Universal-Cyclops Steel Corp.

CARL BERNDT
Timken Roller Bearing Co.

FRANK L. BOGART
Marblette Corp.

J. Y. RIEDEL
Bethlehem Steel Co.

W. L. KENNICOTT
Kennametal Inc.

C. T. FLETCHER
Braeburn Alloy Steel Corp.

JACOB S. DISSTON JR.
Henry Disston & Sons Inc.

T. G. BARNES
Firth Sterling Inc.

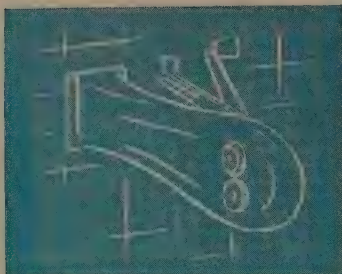
H. M. GIVENS JR.
Crucible Steel Co.

E. J. REITLER
Carbidie Inc.

DAVID J. GILES
Latrobe Steel Co.

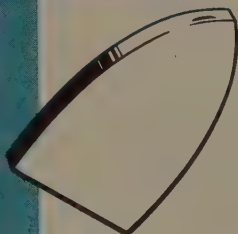
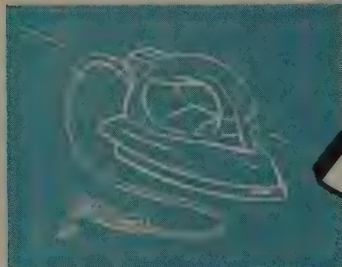
DALE KNEPP
Kish Resin Inc.

HARRY W. HIGHRITER
Vascoloy-Ramet Corp.



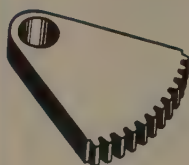
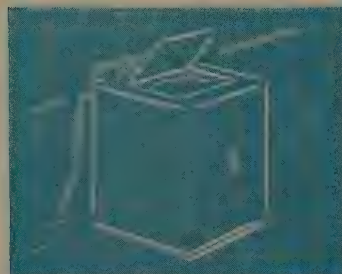
DETROIT BROACH TOOLS CAN OPENER WHEEL

The serrations on the gripper wheel of can openers are produced with Detroit Broach tooling. While taking a big bite out of production costs, broaching produces sharp teeth with consistent form that requires no additional machining.



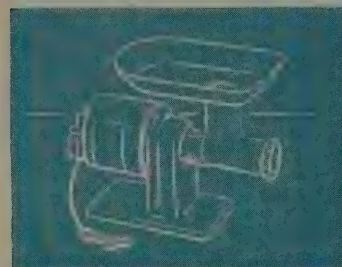
DETROIT BROACH TOOLS FLAT IRON SHOE

In one fast pass, Detroit Broach tooling machines the faces of these shoe castings sufficiently smooth and flat that only an additional buffing operation is required. On such castings of iron or aluminum, output is high and money is saved.



DETROIT BROACH TOOLS WASHER QUADRANT

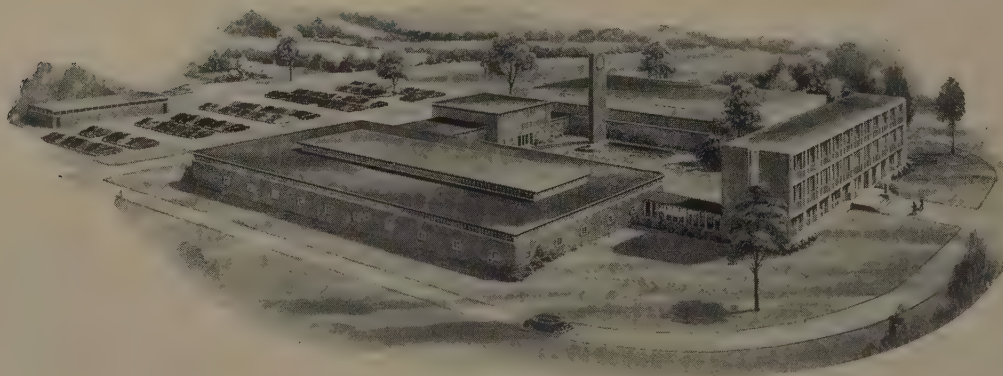
Detroit Broach tooling produces twelve involute teeth in washer quadrant castings with a $\frac{1}{32}$ " depth of cut, accuracy of the involute is easily held within .001". In addition to accuracy, broaching is washing the spots off previous production figures.

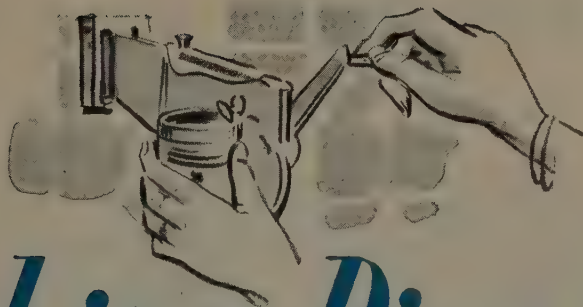


DETROIT BROACH TOOLS GRINDER BLADE

Producing the internal tooth form in meat grinder blades would be a slow task by any method other than broaching. But Detroit Broach tooling produces the entire form in one pass with a surface finish so smooth that no additional finishing is required.

This is a view of the new, ultra-modern Detroit Broach plant and offices located in Rochester, Michigan—just outside Detroit. Designed by Sture Frolen, eminent Swedish architect, it embodies many important advancements that contribute to employee morale and manufacturing efficiency. Another example of the unusual facilities of Detroit Broach Company.



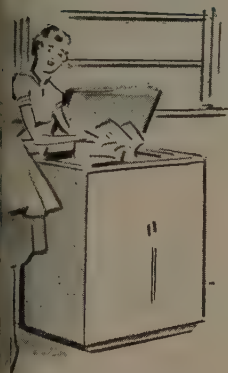


Broaching Pioneers

IN THE APPLIANCE INDUSTRY

Thanks to the ingenuity of America's appliance industry, today's housewife has been elevated from the status of hand laborer to that of a skilled technician. In every phase of her daily housework, mechanical and electrical tools lighten her work and shorten her working hours.

To bring these worksavers within the reach of the *average* housewife has called for the application of the most economical production techniques. And that is why the appliance industry has long relied upon Detroit Broach tooling—to help them shave costs while maintaining a high level of quality. At the left are four examples.



in YOUR industry, too,

you will find countless examples of Detroit Broach tooling that is putting the squeeze on manufacturing costs. At the same time it consistently raises production output per man with automatic repetitive accuracy.

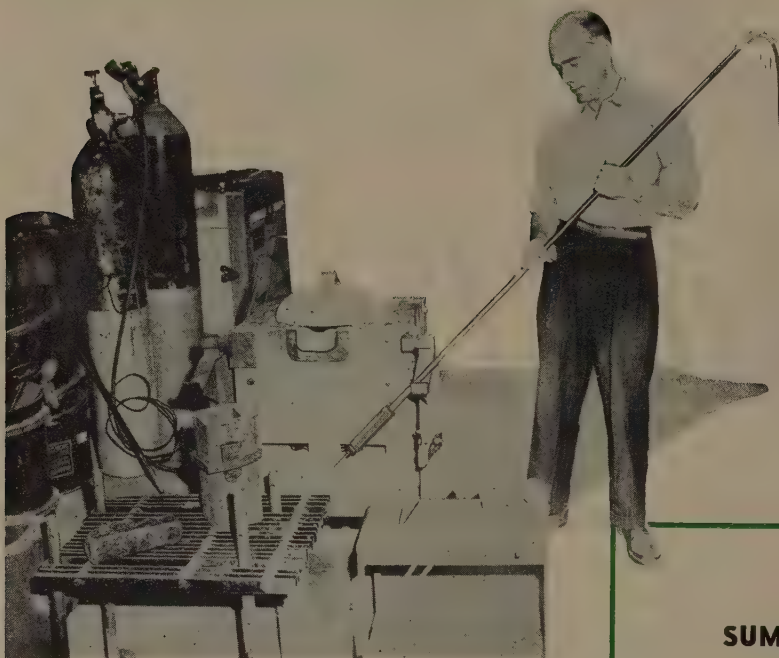
Part of the reason for the performance of Detroit Broach tooling is due to the fact that our entire efforts and facilities are keyed ex-

clusively to this one machining technique. Another reason is our conviction that the conventional approach is not always the best approach . . . we point to some of broaching's great advancements as evidence.

Why not investigate the all-round economies that these facilities and this thinking can achieve in your plant. There is a Detroit Broach representative in your locality who can give you all the answers. Drop us a line and we'll have him call at your convenience.

Detroit Broach COMPANY
ROCHESTER, MICHIGAN

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD



Furnace, sampling devices and platinum-rhodium thermocouple used in the investigation are shown. Gas bottles at the left were used when a controlled atmosphere was desired.

Desulphurization with RARE EARTHS

Some new test data add importance to rare earths in this role. Some heats have had better than 90 per cent desulphurization, but slowing reversion time is the real problem

CURRENT interest in steels treated with rare earth metals and their compounds probably parallels the picture of fifteen years ago concerning the use of boron in steels.

Some of the advantages of steels treated with rare earth additions have been demonstrated using specific grades or types of steel; however, one important controversial aspect of the problem pertaining to the desulphurization phenomenon could use any additional factual information or data to help establish and clarify the desulphurization effects displayed by the rare earth metals.

The Program—To study some of the fundamentals governing the rare earth-sulphur reaction in liquid steel, the following general procedure was used: Induction furnace heats were melted to the desired car-

SUMMARY OF RESULTS

1. Rapid desulphurization (followed by some type of sulphur reversion) was obtained when rare earth metals were added to carbon steels produced in basic-lined induction furnace melts.

2. Desulphurization occurred in both deoxidized and non-deoxidized steels. Sulphur drop was less in undeoxidized steels. Carbon content apparently has no significant influence on desulphurization results. No significant difference was noted when either aluminum or ferro silicon was the deoxidizer.

3. Initial sulphur drop was followed by fast reversion whenever temperature was relatively high and minimum sulphur content high. Low holding temperatures and low minimum sulphur favored a condition of fairly constant sulphur content for a time before final reversion began.

4. Under oxidizing or air atmosphere, sulphur reversion occurs until practically the original sulphur content is restored. Under neutral or natural gas atmospheres, limiting sulphur content after reversion was lower than the original content.

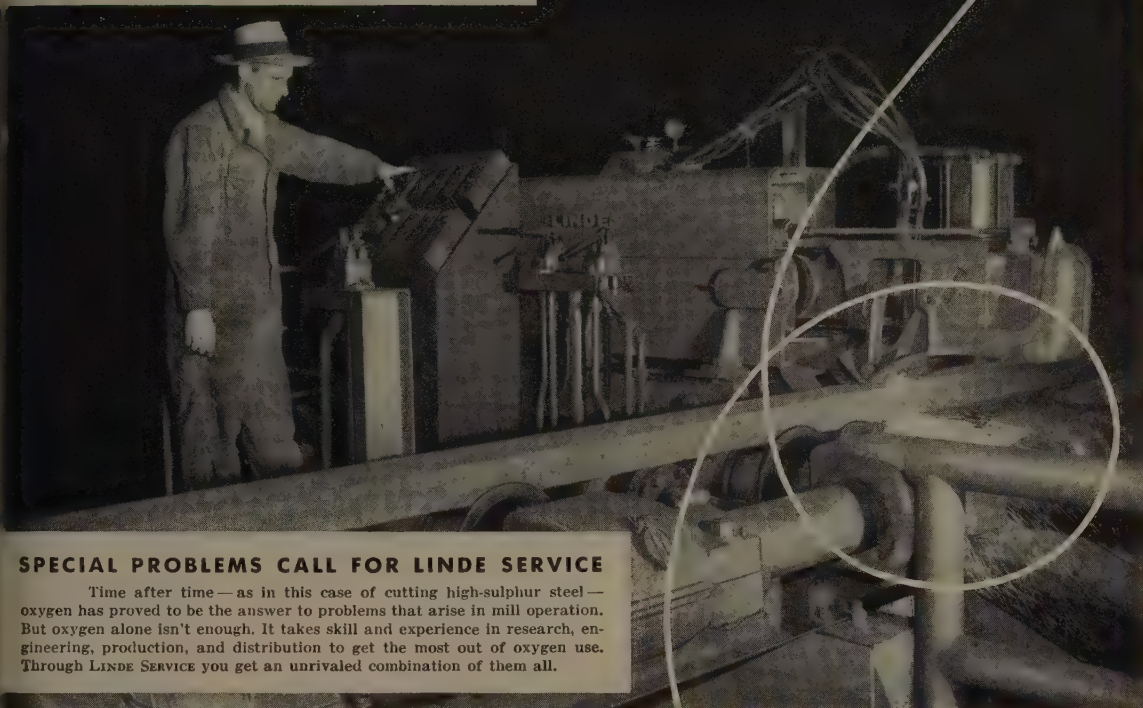
5. Rare earth misch metals (L-metal and an 80 per cent lanthanum lancer-amp), produced practically equivalent desulphurization under test conditions.

6. X-ray diffraction analyses indicate a CeO_2 type crystalline component as one of the constituent phases in slag scum samples obtained after sulphur reversion takes place.

Low Oxygen... and **LINDE SERVICE***

HELPED A STEEL MILL CUT "CROP LOSS"

BY **\$60,000** A YEAR



SPECIAL PROBLEMS CALL FOR LINDE SERVICE

Time after time—as in this case of cutting high-sulphur steel—oxygen has proved to be the answer to problems that arise in mill operation. But oxygen alone isn't enough. It takes skill and experience in research, engineering, production, and distribution to get the most out of oxygen use. Through LINDE SERVICE you get an unrivaled combination of them all.

The 4" x 4" billets coming from a rolling mill in a large steel plant are 140 feet long. They must be cut to shorter length for transfer to the next mill.

Because the billets are high-sulphur steel, conventional shearing resulted in split ends. More than 100 tons of steel per month were being lost in cropping the defective ends. Production was slowed.

Then LINDE SERVICE stepped in. Working with the mill people, LINDE engineers designed and installed a high-speed oxy-acetylene flame cutting system. Result? No more split ends... billets are now cut quickly and cleanly. A production bottleneck was broken. The mill figures it is saving at least \$60,000 a year.

If your company uses oxygen, LINDE SERVICE can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY

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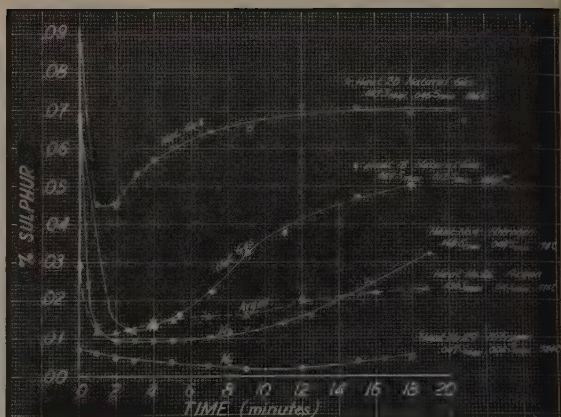
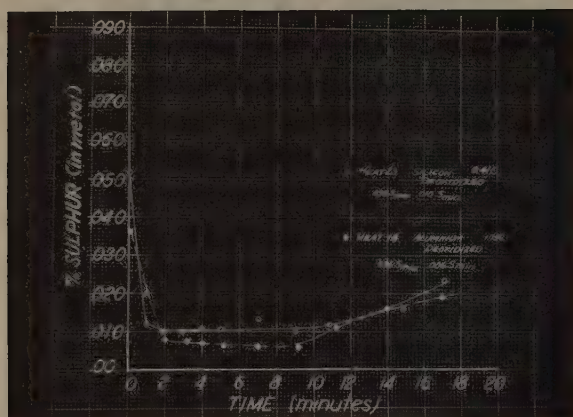
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is the unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.





Heats made under air atmosphere show slow reversion

Typical heats made in four different gas atmospheres

bon and sulphur content, then given varying amounts of rare earth additions, then sampled at regular intervals during controlled holding time for sulphur determinations.

In this study, 33 heats were made in the 50-pound Ajax induction furnace with a magnesia crucible lining. Several types of iron charged materials were available, namely electrolytic iron, low-sulphur pig iron and low carbon steel scrap "boiler punchings" which were used as the base melting stock of the majority of heats.

Sulphur Controls — When some of the high sulphur heats required additional sulphur, beyond that amount in the charge, the addition was made by using ferrous sulphide. When it was necessary to produce heats having very low

sulphur content, varying proportions of electrolytic iron and scrap were charged. The range of initial sulphur contents of the metal bath covered in this study varied between 0.007 to 0.100 per cent sulphur.

During the initial stage of the investigation the carbon content was held at a low level (around 0.05 to 0.15 per cent carbon) so that effects of the rare earth-carbon reactions could be minimized. Some of the later heats had carbon contents of about 0.50 per cent or greater. The high carbon content heats had a decided advantage during the melting stage for they produced a less violent boil than the very low carbon heats.

Atmosphere Controlled — Preliminary desulphurization results

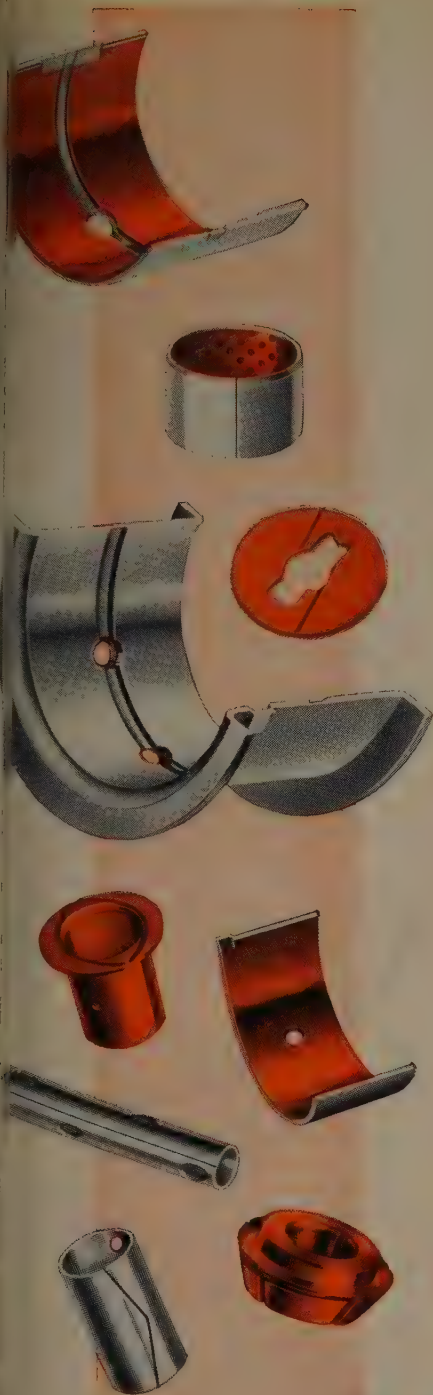
indicated that it would be helpful if the furnace atmosphere above the molten metal bath could be controlled or held at discretion of the operator. Consequently many of the heats were made utilizing a cover or lid that was placed over the furnace and sealed with moist air drying sillmanite. When inert gases or natural gas was used as a protective atmosphere, the gas was fed into the furnace through one of the holes in the cover.

A so-called "reducing atmosphere" was produced by using a stream of natural gas, whose pressure was merely adjusted so that the flame burning from the cover outlet hole varied between one and two inches in length.

During the controlled furnace (Please turn to page 117)

Table lists results of a number of air controlled atmosphere heats

Heat No.	S ^{Max}	S ^{Min}	Per Cent S Drop	Temperature °C	Atmosphere	Deoxidant	# L-Metal/Ton	Per Cent C
33	0.032	0.003	91	1545	Air	Si	8 L	0.505
32	0.038	0.004	89	1575	Air	Al	8 L	0.505
11	0.063	0.007	89	1565	Air	Al	8 L	0.065
10	0.047	0.005	88	1615	Air	Al	8 L	0.093
27	0.068	0.011	84	1550	Air	Al	8 L	0.495
83	0.036	0.006	83	1680	Air	Al	8 L	0.175
81	0.052	0.010	81	1580	Air	Si	8 L	0.410
30	0.040	0.002	95	1605	Nitrogen	Si	16 L	0.590
9	0.068	0.009	87	1595	Nitrogen	Al	8 L	0.178
13	0.041	0.006	85	1620	Nitrogen	Al	8 L	0.180
18	0.067	0.012	82	1665	Nat. Gas	Al	8 L	0.088
26	0.030	0.012	60	1670	Argon	Si	8 L	0.575
15	0.046	0.023	50	1615	Argon	Al	4 L	0.142
20	0.087	0.045	48	1610	Nat. Gas	Si	8 L	0.186
22	0.069	0.039	44	1625	Nat. Gas	Si	8 L	0.870
29	0.007	0.003	43	1655	Nitrogen	Si	8 L	0.324

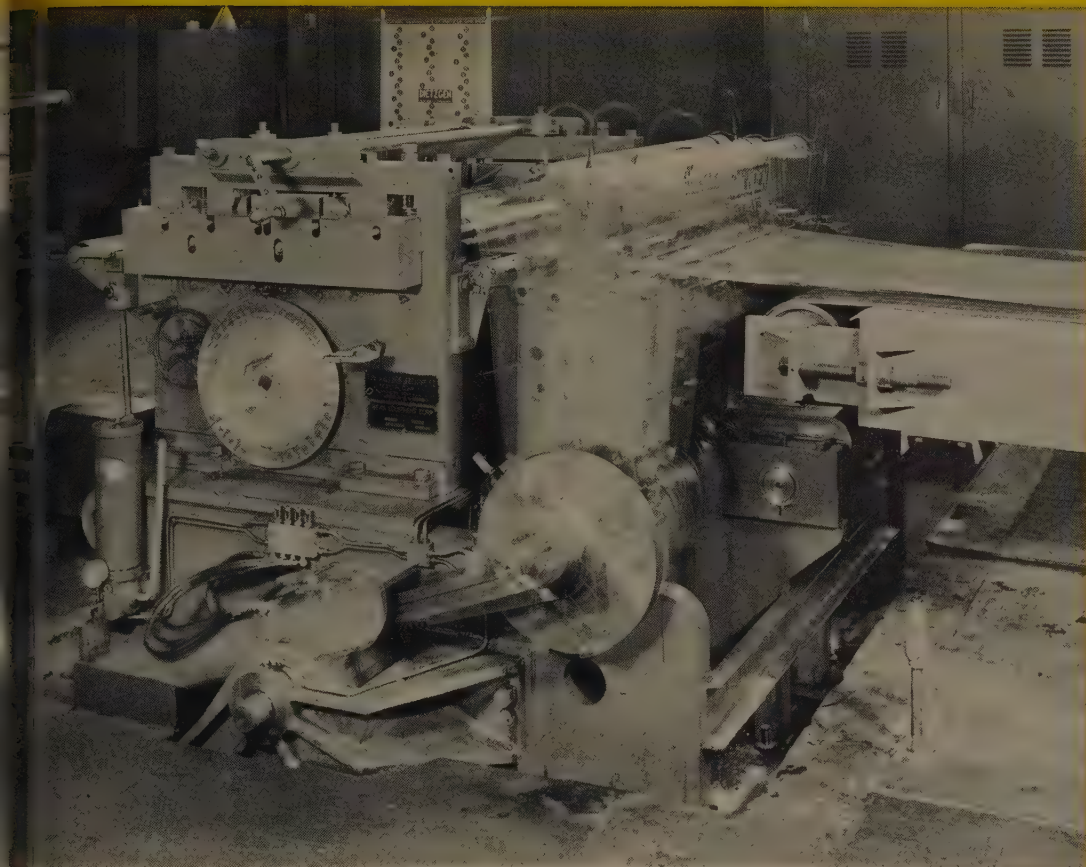


A wide variety of designs and sizes of sleeve bearings, cast bronze bushings, precision bronze parts, bi-metal and rolled split bushings, washers and spacer tubes. Research, engineering, quality control, large-volume production.

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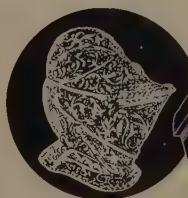


Slitting and Flying Shear Line On Your Steel Costs

The secret of these tremendous savings is a short cut in getting steel from coil form to fabrication. If you are not one of those already using the Wean Slitting and Flying Shear Line you are either paying the extras for shearing to tolerance and size or are forced to do this operation expensively and slowly in your own plant or a costly combination of both.

The Wean Slitting and Flying Shear System eliminates this entire processing function by converting steel from coil to production size, at resquared tolerances, at a rate of 100 cuts per minute.

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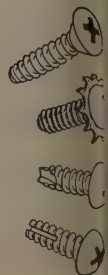
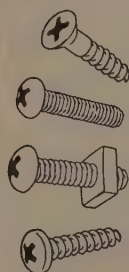


Well, he had to do *something* . . . production falling off, employees dropping out, new people hard to find. So this plant super took a long look at his assembly operations . . . soon found the engineered answer in American Phillips Screws that are easy to handle, easy to drive, easy to build new profits on. Nothing difficult or long-drawn-out about this procedure . . . *you* can start right now. Write:



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phere tests, samples had to be obtained by the bulb squeeze method in which a length of silica tube is inserted into the metal and the sample drawn by means of an aspirator bulb. For heats made under an oxidizing atmosphere, samples were obtained by dipping plumber ladles (low carbon steels two or three inches in diameter) into the bath.

Test Results—Majority of heats were made utilizing an oxidizing atmosphere over the bath after metal addition. In fact, 18 heats were made under this program, some of which were deoxidized with aluminum or ferrous silicon, and heats were studied without any deoxidation, prior to the rare earth metal addition.

To heats were made using an 80 per cent lanthanum alloy, while the other 16 heats utilized an "L-metal" addition containing 50 per cent cerium, 30 per cent lanthanum and the balance rare earth alloy. In all heats, a marked decrease in sulphur content or sulphur drop was found to occur following rare earth metal addition.

Sulphur Drop — For the heats made under an oxidizing atmosphere, one group of curves shows that the sulphur was eliminated very quickly, usually within one to two minutes. The minimum sulphur point lasted for a very short time followed by a steady sulphur reversion.

Repeating, this first group of heats made under an air atmosphere may be characterized by a rapid decrease in sulphur content, generally occurring within the first two minutes after the rare earth addition; this was then followed by an appreciable sulphur pickup that approached the original sulphur content of the bath before the rare earth addition.

Test Result—Heat No. 30 (p. 11) made under a nitrogen atmosphere, illustrates the use of 16 pounds of L-metal per ton of steel which had been previously deoxidized with silicon. An original sulphur content of 0.040 showed a 95 per cent sulphur drop when a minimum of 0.002 per cent sulphur was obtained. This heat made at a relatively low temperature rep-

resents the best sulphur elimination obtained in all the heats studied.

"Sulphur drops" varied between 25 and 78 per cent for heats made under air atmospheres. For these heats (19, 25, 5, 2, 24, 8, 7, 17, 3, 4, and 31) the effectiveness of the desulphurization of the steel by rare earth metal did not produce a positive correlation with steel carbon content. Carbon contents of the steel heats in this group vary from a minimum of 0.082 carbon to a maximum of 0.595 per

cent carbon, as in Heat No. 31.

Heats made under air and controlled atmospheres show a rapid desulphurization followed by a relatively low sulphur level before reversion begins. Some of the best desulphurization results and reversion prevention or minimization were obtained in heats held at relatively low temperatures.

From a paper prepared by J. Alfred Berger, Dept. Head, Metallurgical Engineering, University of Pittsburgh; and Matts G. Snellman, formerly a research fellow at Molybdenum Corp. of America, now at Imatra Steelworks, Finland. Paper was presented by Mr. Berger at the February meeting, AIME, New York.

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Beryllium Spikes Alloys For Tough Jobs

Pouring beryllium copper master alloy from arc furnace at Brush Beryllium Co.

"THE ONLY light metal with a high-melting point," were the words used by C. B. Sawyer, board chairman, Brush Beryllium Corp., as he opened the Beryllium Conference—a feature of the midwinter meeting of the American Society for Metals at Boston.

Beryllium melts at 2345°F, which is higher than copper and almost twice that of aluminum or magnesium. The metal is almost as light as magnesium and keeps its polish better than aluminum, and it has a modulus of elasticity

above 40 million psi, compared with about 30 million for steel.

Even so, uses for pure beryllium are scarce. The metal is making a name for itself as an alloying element, where a little goes a long way. Known for its potent precipitation hardening ability, the heat treatable beryllium-copper is the hardest and strongest copper base alloy known commercially, producers say.

Basis For Hope — Favorable strength-weight ratio of beryllium over other light metals (including

zirconium and titanium) and its ready availability today in substantial tonnage promise increased use of the pure metal in special devices. Its lightness, exceptionally high modulus and good machinability are pay-off factors.

By far the largest use in present form is in the nuclear energy field. Beryllium has an extremely low neutron absorption cross section—about 1/20 that of zirconium, often thought of as the atomic favorite. Coupled with this is its ability to moderate or slow down the

PROPERTIES OF WROUGHT BERYLLIUM-COPPER ALLOYS

Alloy	Condition and Temper	Tensile Strength psi	Yield Strength 0.2% Offset	Proportional Limit 0.002% Offset psi	Elongation % in 2 in.	Fatigue Limit 100 Million Cycles psi	Rockwell Hardness B or C Scale	Elec. Cond. % IACS
2% Be	Heat Treated from Hard	185-210,000	160-185,000	95-130,000	1-2	40-46,000	C40-44	22-30
2% Be	Hard	95-120,000	95-112,000	70- 85,000	2-4	33-38,000	B94-99	15-17
2% Be	Heat Treated from Sol.-Annealed	165-180,000	130-150,000	70- 80,000	5-8	35-40,000	C36-40	22-30
2% Be	Annealed	60- 80,000	28- 36,000	15- 20,000	35-50	25-30,000	B45-65	17-19
1.2% Be	Mill Hardened	125-140,000	105-125,000	60- 65,000	12-20	30-35,000	C23-30	22-26
1.2% Be	Heat Treatable	55- 65,000	18- 30,000	15- 20,000	40-60	25-30,000	B65 Max.	18-22
0.5% Be	Heat Treated from Hard	105-130,000	100-120,000	60- 80,000	5-10	30-35,000	B92-100	48-60

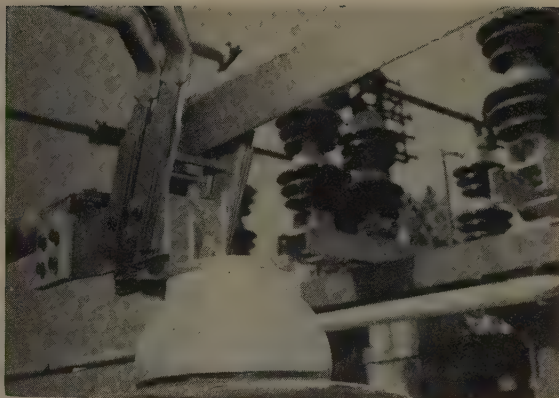
Based on data given by N. W. Bass, Brush Beryllium Co., at ASM Midwinter Meeting, Boston

BERYLLIUM-COPPER ALLOY PROPERTIES

1. Good formability before heat treatment
2. A-1 machinability when annealed or semi-hard
3. Simple heat treatment increases physicals
4. High electrical and thermal conductivity
5. Unusual resistance to fatigue and impact
6. Corrosion resistance comparable with copper
7. High stability under load
8. Castability good
9. Stable at elevated temperatures
10. Nonmagnetic and antisparking
11. Wide range of properties possible through change in beryllium content or heat treatment procedure

WHO MAKES THEM

Beryllium Corp., Reading, Pa. and Brush Beryllium Co., Cleveland, are the two large primary producers of beryllium products. Also, Clifton Products Inc., Painesville, O., on a smaller scale. Other companies who fabricate beryllium-copper alloys into wrought or cast form: Riverside Metal Co., Riverside, N. J.; Ampco Metal, Inc., Milwaukee; Wilbur B. Driver Co., Newark, N. J.; and P. R. Mallory & Co., Indianapolis. Slagle Beryllium Co., Upper Darby, Pa., Penn Precision Products Inc., Reading, Pa., General Plate Division, Attleboro, Mass., and American Silver Co., New York, have reroll mills for thin strip. Little Falls Alloys Inc., Paterson, N. J., produces fine wire.



Beryllium Corp.'s mill hardened "Beryldur" in switchgear application

stabilizer. (Properties of several beryllium alloys are shown in table.)

The standard 2 per cent alloy combines good electrical conductivity and highest hardness and strength of any copper alloy. It has good fatigue resistance, stands up to corrosion and wear, is easy to form and is nonmagnetic.

It is widely used for springs, pressure responsive bellows, diaphragms and bourdon tubes, electrical contacts, aircraft engine parts, cams, bearings, resistance welding electrodes (RWMA Class 4), flash-welding dies, plastic molds, marine propellers, pump parts, gears, valve parts, bearing retainer rings, cowl flap hinges, spring shims and washers, precision castings, rollers and gun mount parts. Low sparking characteristics are important for safety tools.

Conducts Better—High electrical and high conductivity beryllium-copper alloys contain 0.25 to 0.70 per cent beryllium, and from 1.5 to 2.5 per cent cobalt or nickel as the grain refiner and stabilizer. They have about one-half the strength and hardness of the 2 per cent alloy; but, electrical conductivity is about $2\frac{1}{2}$ times higher. Another advantage: Better elevated temperature properties.

Applications include: Resistance welding electrodes (RWMA Class 3), spot, seam, flash and projection welding dies and electrodes, switches and switchgears, circuit breakers, electrode holders, marine diesel brake and clutch drums, pinions, sliding contacts, electrical

through the grains of the metal and harden it.

The reheating process may be varied in practice so that the degree of precipitation hardening is varied to give a wide range of properties—from the softest state with high formability to the hardest with high strength.

Types—Beryllium-copper alloys are classified as high strength, or high conductivity materials. High strength alloys contain over 1.5 per cent beryllium; they offer maximum strength and hardness. High conductivity alloys, under 0.75 per cent beryllium, are preferred where electrical or thermal conductivity is more essential than maximum strength or hardness.

A new beryllium-copper containing about 1.2 per cent beryllium has been developed by Beryllium Corp., Reading, Pa. Known as "Beryldur" it has properties between the high strength and high conductivity alloys. Because of its lower beryllium content, it is cheaper than the 2 per cent alloy.

Standard—Best known beryllium-copper alloy contains 1.8 to 2.05 per cent beryllium, and about 0.35 per cent nickel or cobalt as a grain refiner and heat treatment

ity of neutrons produced in fission. Metal is also important as x-ray discs or "windows" because of its high permeability to x-rays. Powder metallurgical techniques are used in fabricating the pure metal. N. W. Bass, vice president, Brush Beryllium Co., says his company produces blocks up to 5 feet by 2 feet by 6 inches or rounds up to 28 inches in diameter. Forms may be readily machined to final shape or used in extrusion or rolling billets.

Alloys First—Precipitating hardening copper or nickel alloys dissolve beryllium in solid solution over a range from about 0.1 to 3.0 per cent. More beryllium is dissolved at high temperatures (still below the melting point) than at room temperature.

Significance: When alloy is heated into the range of higher solubility for beryllium and cooled quickly, the metal is retained in supersaturated solution (alpha phase); alloy is soft and workable at room temperature. However, upon reheating to a relatively low temperature (below red heat), the supersaturated solution precipitates out submicroscopic particles of beryllium compounds (gamma phase), which are scattered

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control heads, current carrying terminals and similar uses where strength, conductivity and resistance to wear, and moderately elevated temperatures are required.

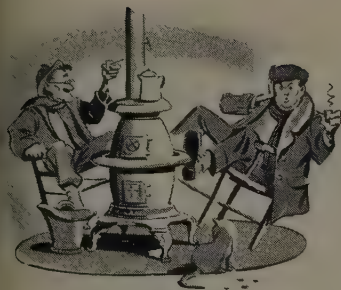
Nickel — Heat-treatable, beryllium-nickel alloys have good strength and hardness; but the amount used is still small. Alloy is precipitation hardened around the 930 to 950°F range. They resemble stainless steels in density and corrosion properties; in strength, hardness and elastic modulus, they compare with high strength alloy steels.

Beryllium Steels—A 1-per-cent beryllium-iron alloy with 6 per cent nickel can be hardened by quenching and aging to around 600 Brinell. Beryllium steels, containing 1 per cent beryllium, 1 chromium, and 11 nickel, have high strength and hardness at elevated temperatures. A German report cites spring properties at red heat.

Others: Beryllium Elinvar (Be, 38 Ni, Bal. Fe), used as spiral springs for watches, has a rate of expansion to temperature that is practically nil. Beryllium Contracid (0.6 Be, 60 Ni, 15 Cr, 7 Mo, Bal. Fe) is used abroad in surgical instruments, corrosion resistant springs and similar applications involving high strength coupled with good corrosion resistance. Elgiloy (Be, Ni, Cr, Mo, Co, Bal. Fe) is used for springs, snap switch components, ball bearing valves, etc. V2B is a heat treatable stainless steel developed by Cooper Alloy Foundry Co. containing 0.1 to 0.2 per cent beryllium.

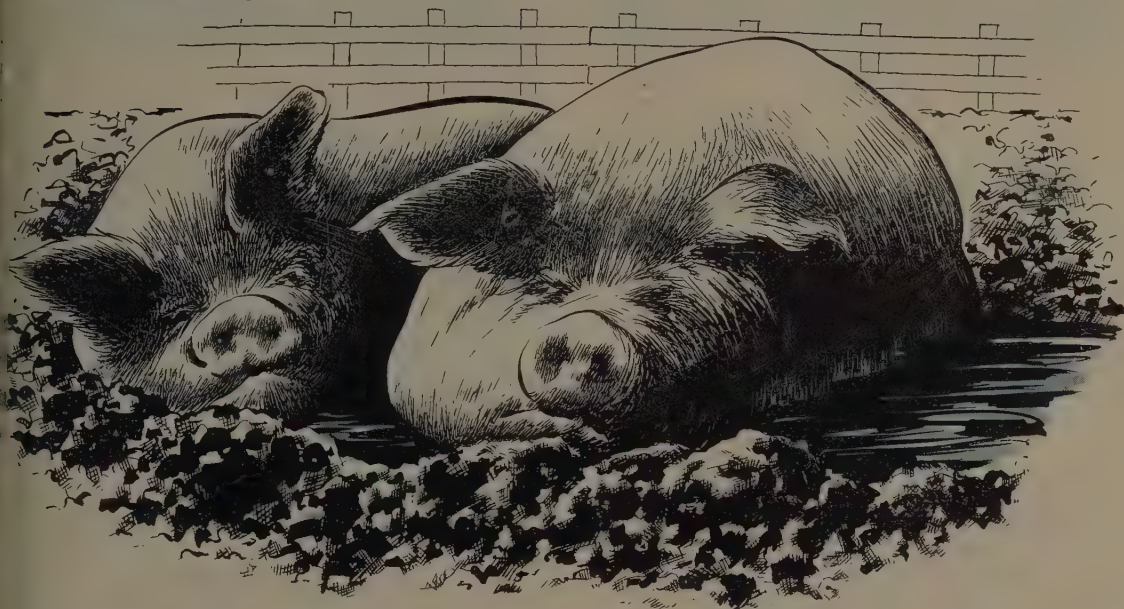
Brass Sub—General Electric Research Laboratories are looking for a new alloy called ZnCuBe, containing 0.1 Be, 2 to 2.5 Cu, balance zinc. It is said to be equal or superior to cold rolled 70-30 brass in physical properties. A cost advantage is also claimed, plus good corrosion resistance. It may find use in lamp and fuse hardware.

Beryllium in aluminum alloy (0.1 to 0.5 per cent) contributes to ease of casting, adds to thermal stability and refines grain. Only 0.005 per cent beryllium added to magnesium or aluminum alloy containing magnesium reduces flammability appreciably and lessens oxidation at melting point.



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General view of the rack storage area set up for operation at Pratt & Whitney, with all books in place in their racks

Library System Catalogs Sheet Stock

Pratt & Whitney Aircraft reclaimed 50 per cent of the space it used for sheet storage, reduced delivery lead time with its new indexing technique

WHAT amounts to a library of welded steel and plywood books functions to simplify storage and handling of the hundreds of alloy sheet metal types required in aircraft engine manufacture. The system is operated by Pratt & Whitney Aircraft, division of United Aircraft Corp., to serve its East Hartford and Southington, Conn., plants.

The storage system is designed for in-plant as well as warehouse storage, is made by Acme Welding, division of United Tool & Die Co., West Hartford, Conn. At the source, Pratt & Whitney concentrates the large quantity of sheet metal necessarily carried in stock. A large building in Hartford is leased for this purpose and houses 1116 books of sheet stock. All receiving, inspection and some shearing take place here.

Branch Libraries—From this hub, books of requisitioned metal move out to so-called branch libraries by truck. In East Hartford plant alone seven such centers located at key production points require a total of 470 books.

When books are empty they are returned to the receiving point for re-use. As a result, the company says there is never a delay on the production line due to lack of the right sheet stock when it is needed. This has definite advantages over the handling situation faced by the division before the current system



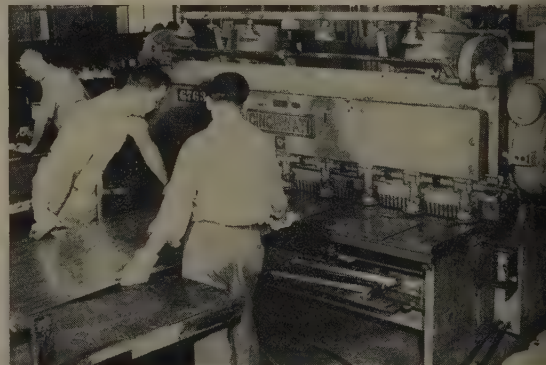
Transfer rack is on transfer table as a pack or book side is positioned and attached to bottom support for closure



After crate is removed and second side of pack attached book is closed and locked, then placed in storage rack



When orders are received for sheet, proper book is removed from rack, placed in V rack and identified sheet extracted



Open book can be placed directly in front of a shear and sheets removed directly from book to the shearing machine

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Better because of the wider latitude in choice of materials, design possibilities and fabrication methods. Shapes and tubing can be produced in Cold Rolled, Hot Rolled and High Tensile Steels. Van Huffel cold forms strip metals 1/2" to 33" wide; regular and irregular shapes in .018 to .312 gauge; tubing from 3/16" to 6" in diameter in any lengths.

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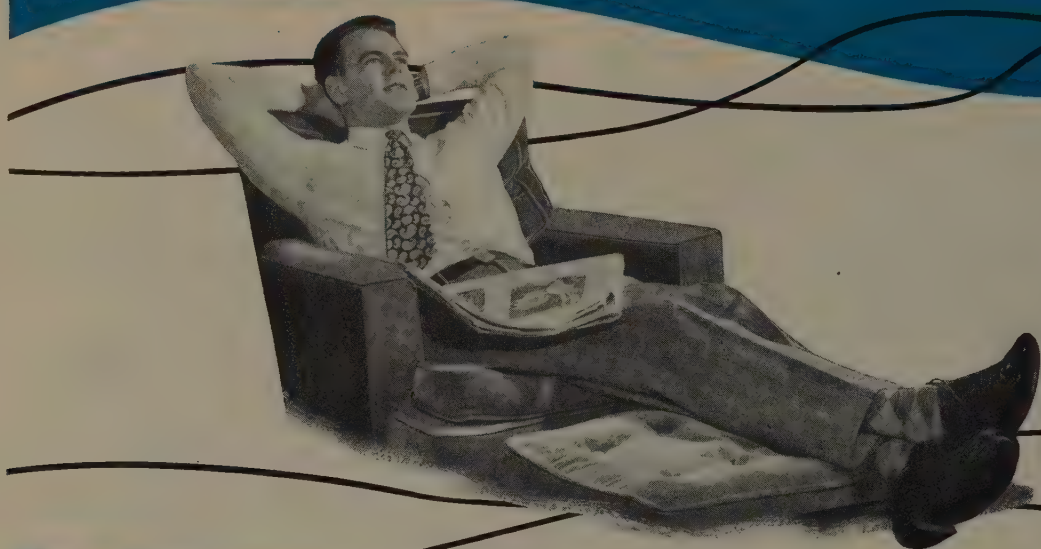
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is installed. Then sheets were
ored in rows of flat crates that
ed up production floor space.
ey were subject to warping and
gging and were scraped and bent
en crates were broken in han-
ing. Usually the type of sheet
quired was at the bottom of the
le.

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hen a crate of sheet is received,
is placed on a welded steel trans-
r, top of the crate is removed
ad a steel channel hinge, welded
eel and plywood cover are con-
ected on top. Then the crate is
urned over by a specially-de-
igned hoist bar. Transfer rack and
e other side of the crate are re-
moved and replaced by the second
ook cover. Completed book is
ung into its proper position in
e vertical steel racks for immedi-
e availability.

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The system's savings are im-
ressive: P & W says it cuts in
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er cent reduction in handling time
through elimination of manual ef-
ort. Delivery time is down from
0 days to 1 day on stock and all
ne stock gets complete protection
uring storage and handling.

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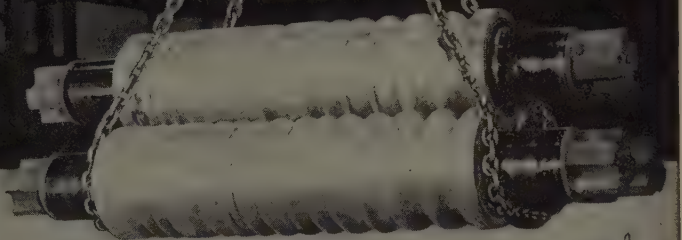
A publication designed to bring
together in convenient form, for
the use of industry, all of the
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of test pertaining to electrodepos-
ed metallic coatings on metals
is available.

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trodeposited Metallic Coatings and
the American Electroplaters' So-
ciety prepared jointly the specifi-
cations and tests in this latest
edition.

Subject headings in the book
are: Specifications for electrode-
posited coatings; method of test-
ing; recommended practices for
treating some specific metals.
Copies may be had by writing
American Society for Testing Ma-
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phia 3. Price is \$1.85.

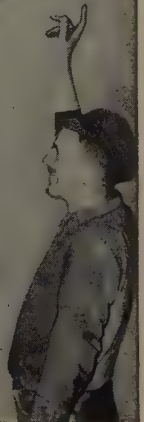
LIFTING ZONE

with
Herc-Alloy
above...



it's
safer
below

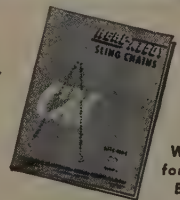
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serial number and can
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at any time to orig-
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The Allegheny Ludlum Steel Corp., pictured above, uses Herc-Alloy Sling Chains for hundreds of tough lifting jobs in its plants. In addition to maximum safety, Allegheny Ludlum also enjoys the extra economy of longer-lasting Herc-Alloy. These sling chains offer still another advantage...a weight reduction unmatched by any other alloy chain without any sacrifice in tensile strength. This reduces worker fatigue. All things considered, don't you think Herc-Alloy Sling Chains are worth a try in your plant.

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Tungsten Carbide Tooling

ROUGH TURNING time for 5- $\frac{1}{2}$ x 18- $\frac{1}{2}$ -inch-long SAE 4340 steel housing assemblies (Brinell 300) was recently reduced from 45 to 18 minutes by switching from high-speed steel tools to standard tungsten carbide tooling.

The operation was performed on a 50-hp Fay Automatic at the Carnes & Mitchell Machine Works, Los Angeles. It consists of reducing the assembly's diameter to

3- $\frac{3}{4}$ inches and leaving a 30-degree profile in the center and a 5- $\frac{1}{2}$ -inch diameter flange on each end of the workpiece. Metal removal per piece amounts to approximately 53- $\frac{1}{2}$ pounds.

Three tools in the back slide plunge-cut the relief grooves and face the flange. Two tools in the front slide rough-turn workpiece's diameter and center profile.

Faster Feed, Speeds—According to Kennametal, the operation is now handled at 3.8 times the pre-



Close Quarter Lifts

Jacks that weigh 38 pounds and raise as much as 30 tons are making repair jobs on overhead cranes easier. Called the Lo-Hite jack by Duff-Norton Mfg. Co., it is hydraulically-operated, lightweight, portable, safe, and its ram can be used with ease 8 feet from its pump.

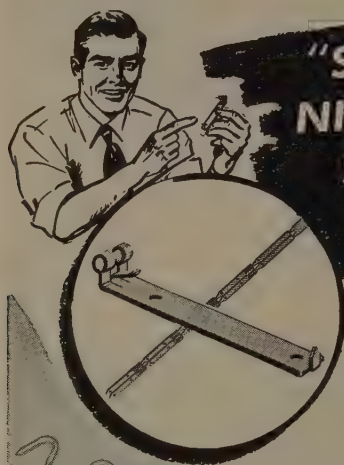
vious speeds and double the previous feeds utilized with three standard Kennametal grade K2 brazed tools in the back slides—two of style C-86 and one of style C-66, and two standard square insert Kennamatics of style SBR 86A in the front slide. Speed is now 230 revolutions per minute and 331 sfm. Feed is 0.024 inch for the front slide and 0.018 inch for the back slide. Although three cuts at 0.300 to 0.350-inch depth are required, machining time has been reduced by 60 per cent.

Brazed carbide tools machine ten pieces per grind, and the square insert carbide tools turn 80 pieces per grind.

Why Do Contacts Fail?

A tiny platinum wire is helping to solve the mystery of why certain metal surfaces on wires and contacts fail at times to conduct electricity, even though they are physically joined. The wire, one-thirtieth as thick as a human hair, is formed into a loop, can be used to detect finger prints and other films built up by oxidation or tarnishing. Even invisible films can frequently be detected.

When compressed against a surface, the resilient platinum probe developed by General Electric Research Laboratory scientists, ferrets out films on the most highly buffed and machined surfaces. Measurement of the pressure exerted with a micrometer suggests film type and electrical strength.



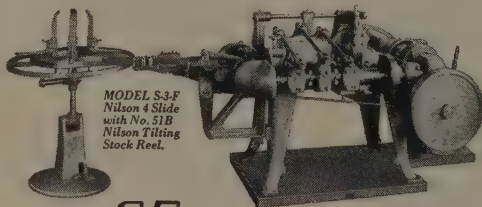
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High strength, good formability and fabricating—good resistance to low temperature impact.

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High strength, moderate forming—improved resistance to atmospheric corrosion.

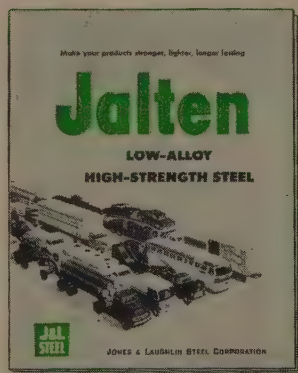
JALTEN No. 3

High strength—improved resistance to abrasion.

Remember to specify JALTEN High Tensile Steel for

- HIGH STRENGTH • RESISTANCE TO CORROSION
- GOOD FORMABILITY • RESISTANCE TO ABRASION

Jones & Laughlin
STEEL CORPORATION — Pittsburgh



The data you want
is in this book:

- Chemical Properties of Jalten
- Mechanical Properties of Jalten
- Jalten Equivalents
- Jalten Application Data

Jones & Laughlin Steel Corporation
Dept. 404, 3 Gateway Center, Pittsburgh 30, Pa.

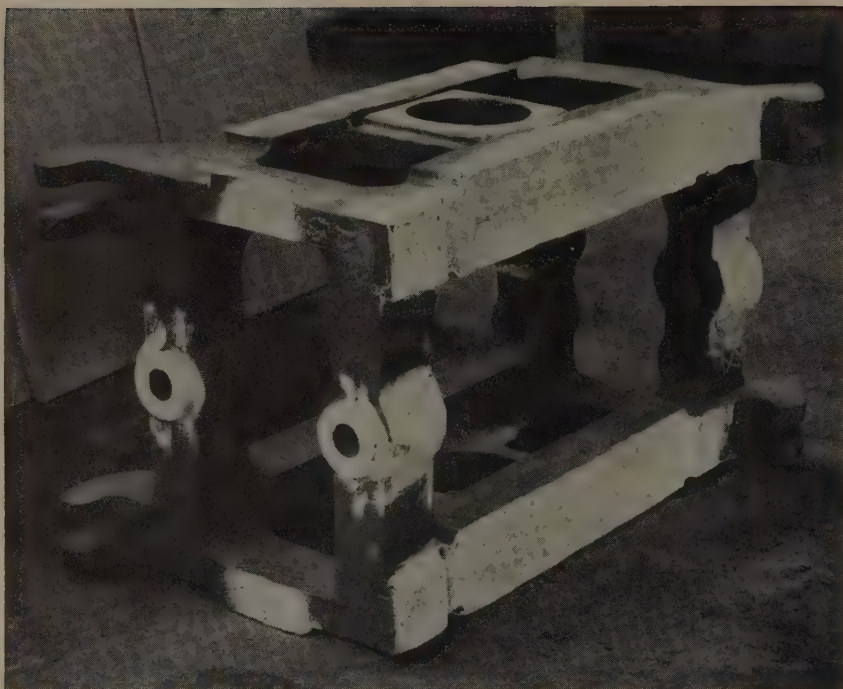
Please forward a copy of your booklet, Jalten low-alloy, high-strength steel.

Name

Company

Address





This 2000-pound frame casting was made originally with a $\frac{1}{4}$ -inch per foot shrink rule. It did not shrink at all because the design necessitated a pattern of nearly 100 cores, and it was impossible to machine and hold dimensions. It was necessary for the foundry to make a new pattern in order to make a satisfactory casting. They have had similar experiences.

HOW TO ALLOW FOR

Shrinkage in Castings

Customers should give the foundry right to specify shrinkage and finish allowances because shrinkage often differs in various foundries. Here's the explanation

IN purchasing and preparation of specifications for medium and large steel castings, the foundry should be permitted to make the pattern with allowances for proper shrinkage or be given the right to specify the shrinkage and finish allowances.

Reason for this, says Hubert Chappie, foundry superintendent, National Supply Co., Torrance, Calif., is that the shrinkage in one foundry often differs from that in another. Several different shrinkages may even occur in one casting, depending upon its design and the materials used in molding and coring.

Here's Why — A better under-

standing of the several factors that enter into shrinkage of medium and large steel castings will show why there is no hard and fast rule for specifying the shrinkage, as there is for the average small casting. Shrinkage may vary from nothing to $5/16$ inch in castings having as much as five tons of metal. Every foundry must establish its own table for pattern shrinkage based on casting design and the method of making molds.

Records have been kept for every steel casting made at the National Supply foundry during the past three years in order to provide a more complete understanding of shrinkage problems. This experi-

ence has been influenced by reported experience of others, including the effect of carbon content of the steel, increase of which decreases "free" contraction.

Main Cause—"Hindered contraction" was named as the main cause of variations in contraction. Hindered contraction is caused mainly by design and the materials and methods used in molding and coring. Changes can often be made to meet user requirements.

There are many known instances of castings in which design has restricted shrinkage and caused hot tears. It may be impossible to avoid hot tearing without a change of design. It may even be nec-



Patterns for right and left hand slide rails, 16 feet long, were made with a $\frac{1}{4}$ -inch shrink rule. The customer paid the cost of removing two inches from each to conform to a $\frac{1}{8}$ -inch rule. Castings shrunk to size

to make two castings and weld them together.

It is better in many instances to make two castings have been welded together, to weld a crack in the part cast in one piece. The shrinkage is invariably increased by making two castings. However, linear shrinkage can then be held to the closest tolerance because of spacing accurately before welding, there will be less hot tearing.

Sand Troubles— Hindered contraction may be caused by the sand, pockets in the cope requiring excessive gagging, and bars in the flasks, ramming, or the utilization of several heads. Sand ingredients are the principal causes. The amount of silica flour affects hard or core restrictions considerably because of expansion. If the strength of the sands exceeds 2000 psi at 2500° F, the possibility of hot tearing of the casting increases.

Although expansion can be counteracted by the addition of cellulose materials and Southern Bentonite, experience indicates that casting surfaces are not free from penetration. It is much better to weld a crack than have sand on the surfaces which cause trouble in machining. Molds in green sand shrink much more than in dry sand. This is natural because it does not have the strength of dry sand to resist shrinkage.

Too Many Gaggers—It is obvious that steel gaggers and bars prevent the mold from contracting, thereby minimizing linear shrinkage. Gagging is probably

overdone because no one knows when a mold has been properly gagged and because of the risk of under-gagging and losing a casting. A molder would be humiliated by his fellow workers if a cope dropped because of too little gagging. Consequently the best alternative is to loosen the bars and gaggers or remove them as soon as the metal solidifies. This permits more linear shrinkage and prevents hot tears.

Ramming has an obvious effect on linear shrinkage. The harder the sand is rammed, the less the shrinkage. Also, the finer the sand, the less will be the contraction. This can be counteracted by creating pockets at a suitable distance from the metal surfaces. These pockets may be open or filled with such materials as charcoal, coke, sawdust, cinders, or loose sand, thus permitting the hard-rammed sand to move during shrinkage.

Use of Relievers—Several heads on one casting would restrict a casting from having free shrinkage in relation to the hardness of the rammed sand between the heads. This also can be counteracted by means of relieving blocks, placed a few inches from risers in the direction of contraction. The blocks can be removed when the metal has solidified, leaving open spaces that do not resist contraction of the casting.

Relievers such as loose dirt or chains have also been used instead of wood blocks. The casting can also be removed from the mold before linear shrinkage starts,

thus removing any stress that may be caused by hindered contraction.

Some Examples—Practice at National Supply, when quoting on large castings (10,000 pounds or more) is to get the customer's permission to make the pattern, or if this is done elsewhere, to specify how the pattern is to be made, the shrinkage, and the amount of finish. In some instances it has been necessary to alter patterns made with a $\frac{1}{4}$ -inch shrink rule to $\frac{1}{8}$ -inch shrink rule.


In another instance a frame casting weighing approximately 2000 pounds was made with a $\frac{1}{4}$ -inch shrink per foot from a pattern that was practically all cores. The casting did not shrink at all and it was impossible to machine and hold dimensions. An entirely new pattern, made to a no-shrink rule, was necessary. The casting was then entirely satisfactory. The foundry has had a number of similar experiences.

Customer vs. Foundry—If a customer's blue print does not call for finish, he is contacted for tolerances. If the required dimensions are too exacting, he is informed, and a record of an agreed tolerance is established.

If all factors preventing free contraction are recognized and remedies are used, or they are taken into consideration in determining pattern shrinkage, much misunderstanding between purchasers of steel castings and foundry engineers would be clarified.

From Mr. Chappie's paper before the technical and operating group of the Steel Foundry Society of America.

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



**You don't need steel inventories
as long as your arm!**

**WHEN YOU BUY STEEL FROM
WAREHOUSE, YOU GET:**

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

BIG steel inventories not only take up space in your plant, but they tie up large sums of your working capital. U. S. Steel Supply can help you avoid both of these problems. We can deliver steel as you need it, avoiding production hold-ups, and keeping steel inventories down to a minimum. Your U. S. Steel Supply salesman will arrange the delivery of the steel you want, at the time and place you want it.

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General Office
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Warehouses
and Sales Offices Coast to Coast

UNITED STATES STEEL

NEW

PRODUCTS and equipment

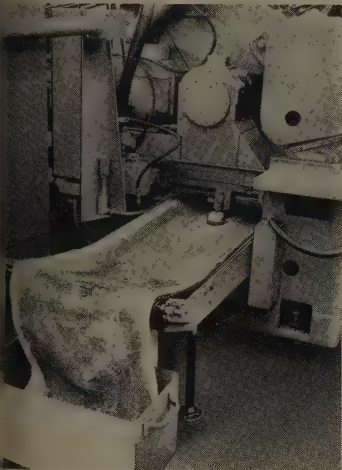
Reply card on page 143 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Coolant Filter

... designed into grinder

Norton engineers have incorporated into the base of their new grinder the Delpark coolant filters. By designing the Delpark principle of filtration into their machines a high degree of efficiency has resulted.

The coolant filters apply a new principle in filtration of coolants. It is a continuous, self-cleaning cavity filter. Solids are filtered from liquids that will flow, by



gravity, through filter material. This discharges the solids, in relatively dry state, into an outside container. Filter material is fed on a conveyor-like basis. Industrial Filtration Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Volt-Ammeter

... is shock-resistant

A hook-on volt-ammeter with automatic scale changing is announced by GE.

Designated the AK-5, the pocket-

size unit is designed to measure current and voltage quickly and accurately. The automatic scale



changing feature eliminates the possibility of reading the wrong scale for application. It has a current range of 5/20/80/350 amperes. The instrument also measures ac voltage in three ranges without auxiliary equipment, provides accuracy up to 3 per cent of full scale and withstands a voltage breakdown test of 4000 volts ac. It will clamp around any conductor up to two inches in diameter. Its contoured trigger closes and opens the hook-on assembly, insulated to safeguard against grounding or short-circuiting. General Electric Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Water Seal

... sticks in any application

An easy-to-apply soft plastic material has been designed for sealing pipe joints, screw threads, gasket joints and flanges on lines handling water, air, ammonia, gas and steam. It is also used on bolts and studs.

The manufacturer claims Vike Water Seal will not shrink, crumble, or crack and contains no corrosive substances. Joints sealed with the material can be broken easily and quickly when necessary.

It is available in 1-pound and 7-pound cans, 25-pound pails, 100-pound kegs and 400-pound drums. Keystone Lubricating Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Pipeline Regulator

... for low pressure areas

An 8900 series of regulators is designed for use with gases supplied by pipeline systems using comparatively low pressures.

They are said to afford greater flow capacities in most cases because of the improved regulation



and lower static increment. These oxygen and cutting regulators will accurately maintain a steady gas pressure eliminating the need for frequent regulator adjustment regardless of fluctuation in the line pressure. Of inverse design, they feature a novel seating arrangement requiring no nozzle. Air Reduction Sales Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

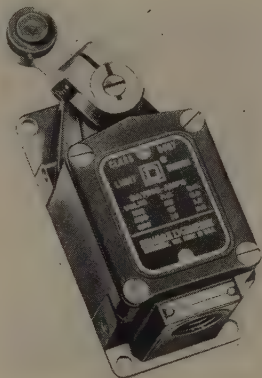
Limit Switch

... easily adjustable

A machine tool limit switch has been designed for easy adjustment of the basic device to obtain eleven different contact operating se-

quences using only a screwdriver.

A variety of operating lever arms is available which can be mounted in any angular position. Although only small travel is required to operate the switch, a



large amount of overtravel (about 80 degrees) is provided in either direction. Diecast enclosures are fully gasketed with neoprene, making them water tight, oil tight and dust tight. Seven types of baseplates, as well as threaded holes in the side of the diecast box, permit mounting in a variety of positions. Square D Co.

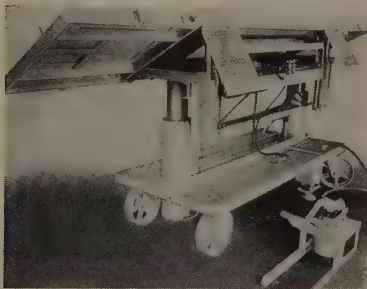
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Sheet Feeding Table

... has built-in safety guards

Designed for fast, accurate stock feeding into an inclinable bed press is a 3-ton capacity Rack hydraulic sheet feeding table. Its tilt top is hydraulically activated.

All welded steel construction



assures dependability. Operated by a two-speed foot pump, a two-way valve controls both the tilt and straight elevation of the table. Ten-inch heavy duty steel casters with roller bearing hubs provide

easy movement with heavy loads. A floor lock brakes the table against movement. Drop sides allow fast handling of longer sheets and strips. Rack Hydraulic Equipment Corp.

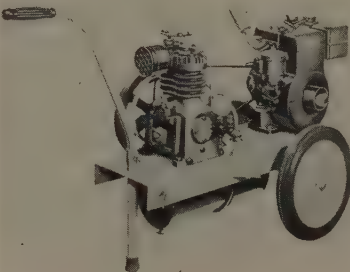
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Air Compressors

... with electric or gas power

A line of portable air compressors is now available in a variety of models.

Designed expressly for spray painting is a 1-hp model, rated at 60 pounds maximum pressure and delivering 5.4 cfm of air. For general utility work a 1/2 and 1-hp compressor has been designed. Both have a 100-pound maximum pressure rating. The 1-hp unit delivers 4.2 cfm of air and the 1/2-hp model has an output of 1.9 cfm. The compressor line is au-



tomatically oiled. The unit has directional fins for uniform cooling. The compressors are equipped with an air tank to eliminate pulsation of delivered air and to collect moisture. Tanks have a drain valve. DeVilbiss Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Seamless Tubing Steel

... resists oxidation

An alloy steel designed for use in equipment operating under conditions involving high stresses and temperatures is available in seamless tubular form, according to the announcement of Tubular Products Division.

By utilizing the hot extrusion production process they make Universal Cyclops Uniloy 19-9 DL alloy available in a limited size range in seamless tubing. It possesses great strength at tempera-

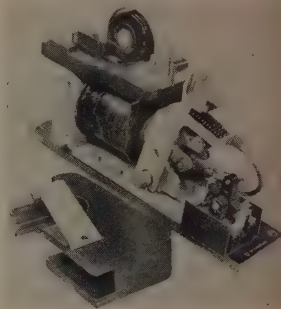
tures up to 1200°F and has been used successfully at somewhat higher temperatures for some applications. Babcock & Wilcox Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Copper-Graphite Contacts

... for high conductivity factors

Electrical contacts made from copper graphite by powder metallurgy processes are offered by Gib-



son. They are designed for use when high conductivity, non-sticking properties and economy are factors.

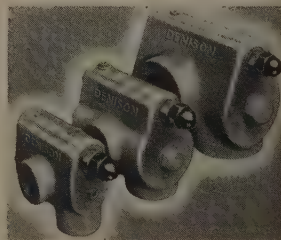
The Gibsily UC-5 and UC-7 powder metal contacts are regarded as an improvement over copper graphite contacts made by impregnating graphite with copper. The process is claimed to impart high electrical conductivity and greater mechanical strength to Gibsily UC-5 and UC-7, which are capable of handling heavy currents without contact sticking. Gibson Electric Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Relief Valves

... regulated by one screw

A new line of relief valves designed for pressure control in 2000-psi hydraulic circuits has been introduced by Denison.



The valves, which are light and compact in construction, are fur-



**WIDE
SKELP
OR
NARROW
SKELP**

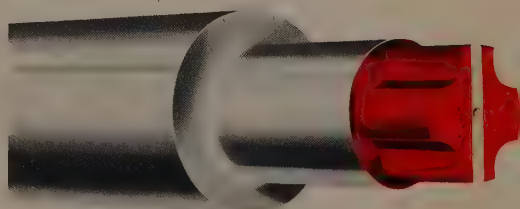
There's a STRIPED RED WABBLER for every type of mill

Mills for rolling skelp are of so many different types that specifications for the proper Striped Red Wabblers Rolls vary greatly.

But the important thing to remember is that Mack-Hemp Rolls have been used on *every* type of skelp mill—including the most modern and the oldest.

When you combine this roll application know-how with the skill of your own operating staff, you're putting together a real production team. Add to that the specialized roll manufacturing experience of Mackintosh-Hemphill and skelp rolling will no longer be a manufacturing problem.

That's why it's always a good idea to keep an eye on what's new at Mack-Hemp.



MACKINTOSH-HEMPHILL COMPANY

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills



Just as a catcher needs protection . . .



IRON and STEEL *Need* PROTECTION

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

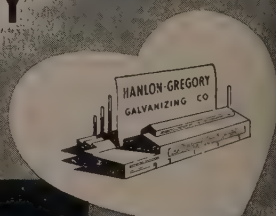
HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant



galvanizing . . . pickling . . . painting . . . oiling

IN THE HEART
OF THE STEEL INDUSTRY



ed with threaded bodies for
line or tee'd connections.
Available in pipe sizes of 1/2, 3/4,
1 and 1 1/2 inches, they are vent-
or operated by remote control.
Pressure settings are regulated by
adjusting a single screw. A re-
mable acorn nut covers the pres-
sure screw for positive oil seal.
The 2000-psi relief valves can also
be used as safety valves for vol-
umes greater than their rated ca-
pacities. Denison Engineering Co.
FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Band Saw Machine

capable of many tasks

A new line of 16-inch band ma-
chines with 12-inch thickness ca-
pacity for shop use are powered
for tough, straight or curved metal
cutting operations. They are, ac-
cording to the manufacturer, more
adequate for sawing woods, plas-
tic and numerous other mate-
rials, and are easily arranged for



band filing, metal polishing and
oxide finishing as well as slicing
of hundreds of other materials by
applying the proper band tool, tool
guides and the use of inexpensive
attachments and accessories built
for the machine. Carbide tools
can be finished on these machines,
an operation added to the long list
of profitable applications for band
machines. DoAll Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Projection Welder

12, 18, 24-inch throats

Model EPT 2 machine is one
of a series of three-phase welders
available in 50, 75 and 100 kva
at a 50 per cent duty cycle. Welder
can be supplied in 12, 18 and 24-

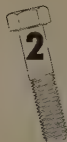
April 12, 1954

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WITH ANTI-CORROSIVE STAINLESS STEEL FASTENINGS



SAVE INITIAL COST! Superior pro-
duction capacity and know-how means
lower costs! Anti-Corrosive is America's
oldest and largest firm dealing exclusively
in stainless fastenings—a good reason to
check Anti-Corrosive *first* for stainless
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STOCK inventory of more than 9,000
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faster, too, due to streamlined production
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jection headaches, means trouble-free
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54C, the *one complete ref-
erence handbook* to stain-
less steel fastenings! Avail-
ability of varieties, sizes
... plus prices and dis-
counts ... *at a glance!*



**ANTI-CORROSIVE
METAL PRODUCTS CO., INC.**
Castleton-on-Hudson,
New York

inch throat depths and with maximum electrode force of 4000 pounds.

Model is available as a combination projection and spot welder, the ESPT, which will make spot welds on large production runs on two thicknesses of clean mild steel in minimum gages of 0.020 and maximum gages of 0.203 inch. The latter model will also spot weld two thicknesses of stainless,

aluminum and other light alloys. Sciaky Bros. Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Copper Strip

... new, close-tolerance grade

Beryllium copper strip is available from Penn Precision Products. In addition to usual sizes and tempers, a new close-tolerance grade, Microstrip, is being supplied.

Available thicknesses run from

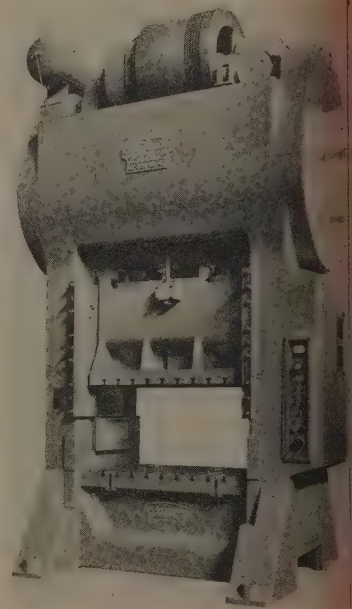
0.001 to 0.032 inch, with minimum tolerances ranging from ± 0.001 to ± 0.0004 inch, depending on thickness. On widths from 3/32 to 5 inches, tolerances of ± 0.001 and ± 0.002 are regularly held. Penn Precision Products Inc.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Two Point Press

... with lighted die area

This Cleveland Two-Point Press is double geared, twin drive and equipped with electrically controlled, air operated drum type friction clutch with spring loaded brake.



The press has a stroke of 8 inches, a 6-inch adjustment, 26-inch distance bed to slide, stroke down and adjustment up, 42-inch x 60-inch bed and slide area and operates at 20 to 40 rpm. Its capacity is 350 tons. Cleveland Punch & Shear Works Co.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

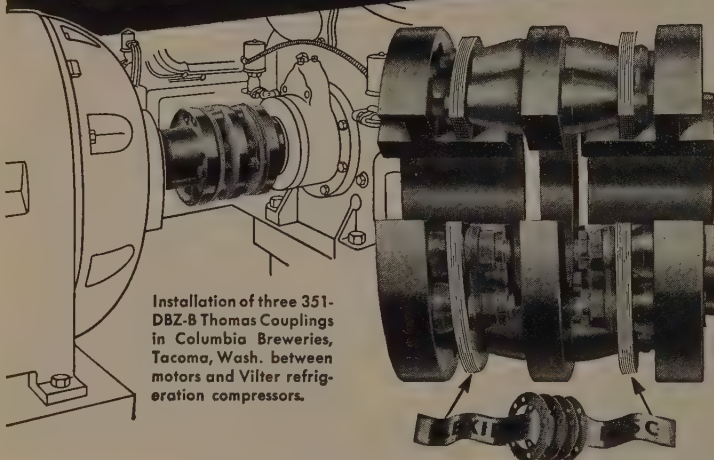
Alkyd-Type Paint

... a one-coat cover

An alkyd-type flat wall paint possessing qualities of durability, washability, mar resistance, uniformity of appearance and ease of application has been incorporated into Wallhide PBX flat wall paint according to the manufacturer.

Just one coat will cover even

THOMAS FLEXIBLE COUPLINGS... for more years of better service!

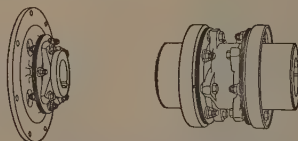


Installation of three 351-DBZ-8 Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

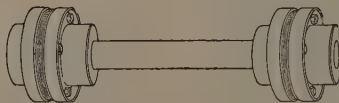
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.

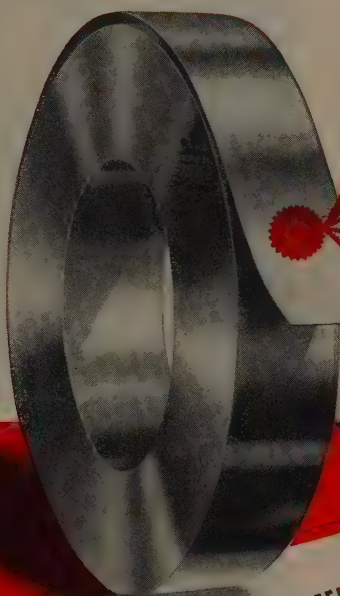


Write for our new Engineering Catalog No. 51A



THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

SIX WAYS... THAT SANDVIK CAN FIT YOUR SPECIALIZED SPRING STEEL REQUIREMENTS



- 1 **PHYSICAL PROPERTIES** — Sandvik quality strip steels are made in special analyses to suit specific applications.
- 2 **HEAT TREATMENT** —Furnished annealed, unannealed or hardened and tempered.
- 3 **GAUGE** — Precision-rolled in thicknesses from .001".
- 4 **FINISH** — Supplied with bright finish or polished bright, yellow or blue.
- 5 **EDGES**—Can be supplied with round edges or square edges.
- 6 **WIDTH** — Available in a wide range of standard widths.

ALSO SLITTING FACILITIES AVAILABLE

SOME SANDVIK SPECIALTY SPRING STEELS
Band Saw Steels; Metal Band, Wood Band and Butcher Band • Camera Shutter Steel • Clock and Watch Spring Steels • Watch Parts Steel • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Razor Blade Steel • Reed Steel • Shock Absorber Steel • Sinkers Steel • Spring Steels • Tape and Rule Steel • Textile Steels • Trowel Steel • Vibrator Reed Steel.



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Watkins 9-7180

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over previously painted surface. No primer is required because the paint is self-sealing. It is easily applied by brush or roller coating, dries rapidly and has no paint odor. The finish may be washed or scrubbed repeatedly without marring it or fading its color. A wide range of colors is available. Pittsburgh Plate Glass Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Parts Washer

... quick and low-cost

A compact, portable, air-powered parts washer provides a new, safe method for the speedy, economical cleaning of small parts, pieces and sub-assemblies. It consists of a leak-proof, electrically



seam-welded safety container with a fusible link in the cover and contains a perforated metal basket for the parts.

It is absolutely safe. The fusible link has a low melting point and automatically closes the cover to smother fire. The air motor may be regulated to move the basket in the cleaning liquid from 75 to 125 cycles a minute by a simple setting of the control valve. The washer will operate at air pressures between 25 pounds and 100 pounds per square inch. Protectoseal Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Thread Comparator

... easily read indicator

This thread comparator is made for fast, economical visual gaging of all forms and classes of internal threads in diameters from 3/8 inch to 1 1/2 inches. Threaded parts can



Tools and Dies Heat Treated in...

HEVI DUTY. Controlled ATMOSPHERE FURNACES

Allis-Chalmers of Milwaukee is using Hevi Duty Controlled Atmosphere Furnaces to heat treat tools and dies made from high carbon, high chrome steels, 18-4-1, molybdenum, and cobalt high speed steels. Maintaining the exact surface carbon content of the tools and dies during heat treating is achieved with —

- A Hevi Duty Endothermic Atmosphere Generator supplying 500 cubic feet per hour of prepared atmosphere. With this controlled atmosphere, troublesome scale and decarburization or carburization of the surface is eliminated.
- A Hevi Duty Box Type Hardening Furnace, designed for temperatures to 2000° F., is used for preheating high speed steels and hardening carbon steels.
- A Hevi Duty High Temperature Furnace, designed for temperatures to 2600° F., is used to harden the high speed steels.

This combination assures you that tools and dies can be treated to exact hardness. Achieve better heat treating results by specifying Hevi Duty Furnaces. Write for Bulletin 153.

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers Constant Current Regulators



Built-in "Bigness" assures you capacity load handling



Polished steel wheels with rim-toughened heads are pressed on and keyed to axles which turn on spherical roller bearings.



Bridge drive shaft, with self-aligning ball bearing pillow blocks, has steel safety type flange couplings mounted close to wheel for easy wheel removal.

When EDERER "job-engineers" a crane for you, it is not only designed and built to your specific materials handling requirements—it is built for heavy duty service. This basic "plus" in all EDERER cranes means oversize parts throughout, each a carefully engineered part of the whole—plenty of safety margin—operating speeds of greatest efficiency. This gives you the most in performance—the least in maintenance—full capacity load-handling at lowest cost-per-ton. If you'd like to know more about how EDERER builds "bigness" into every crane—why not send for the new EDERER crane catalog—Bulletin CR-610?

260C54

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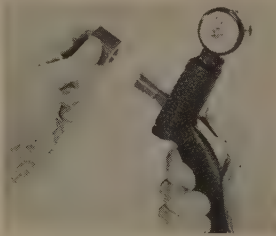
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be gaged at the inspector's bench, beside the machine or on the machine at a rate of 20 or more pieces per minute.

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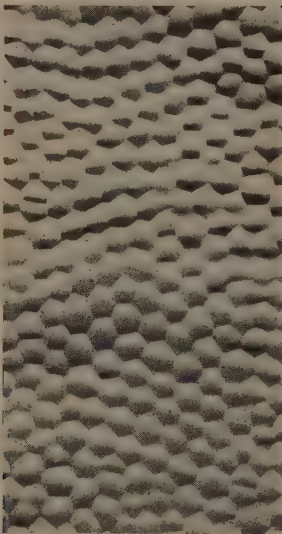
be checked with a simple adjustment of the indicator tolerance hands. One thread segment is collapsible, permitting fast loading. Easily removable, the thread segments permit interchangeability and fast setup. Hanson-Whitney Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Hammered Metal Finish

... in rigid-tex metal pattern

Expensive hand-hammered metal effects are available in any metal, strip or sheet up to 38 inches wide, at a fraction of their



former hand-finished costs. The three-dimensional pattern is produced in quantity by Rigidized Metals.

Called 1-HM pattern, it has a maximum depth of 0.025-inch on metals up to 0.0312-inch thick. Rigidized Metals Corp.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 143 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Weed, Grass Control

E. I. duPont de Nemours & Co.—A 10-page brochure on duPont's low-cost weed and grass control Telvar W weed killer is offered. Some of its uses are shown and the results that can be obtained are outlined and illustrated.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Thermistors

General Electric Co.—Carbology Department offers a 52-page manual that will enable users to understand what Thermistors are, how they are applied, what functions they perform and what benefits industry can derive from them in detecting and compensating temperatures, and providing time delay or surge control in electrical equipment.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Metal Gratings

Penn Metal Co. Inc.—A 27-page catalog offered by Penn entitled "Expanded Metal and Expanded Metal Gratings" covers such subjects as standard expanded metal, flattened expanded metal, air flow tables and fabrication. Use of the Pennmetal product is amply illustrated.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Burmix Burners

Eclipse Fuel Engineering Co.—Eclipse offers a bulletin on their Burmix burners. Construction specifications, capacity and selection data are included with schematic drawings and illustrations.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Sintering Conditions

Mellon Institute—Availability of a publication, "Sintering Conditions and Sinter Properties as Affected by Moisture and Fuel," is an-

nounced by the institute. Written by H. A. Morrissey and R. Powers, 22 pages give detailed information, with text supported by charts and a schematic drawing of an experimental sintering machine.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Grinding Fixture

Bryant Chucking Grinder Co. Bryant's shoe-type centerless internal grinding fixture is described in a 2-page leaflet. The illustrated leaflet is complete with all essential specifications.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Heat-Resistant Finishes

General Paint Corp.—Descriptions and technical data on new high-heat-resisting finishes for temperatures as high as 1600° are contained in a 4-page bulletin released by General Paint. Physical properties, applications and economic advantages of special finishes for hot metal surfaces are given, along with application directions.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Turning Machine

Monarch Machine Tool Co.—A 4-page brochure covers the Monarch series 61 lathe with fingertip 4-way power rapid traverse. Its advantages and applications are listed and illustrated.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Control Motors and Valves

Minneapolis-Honeywell Regulator Co.—Catalog 8203 covers the complete line of Honeywell industrial control motors and industrial motorized valves. Included are specifications, ordering information and a price supplement for these motors. Catalog also contains information and specifications

Here's why

The NEW L.A. Line

by the Louis Allis Co.

is your **BEST**
electric motor **BUY**

A smaller,
better
power package
to meet new
NEMA standards

with NEW
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Improved ventilation

New conduit-box arrangement

New bearing construction

More compact design and better protection

More versatile mounting

Here you have complete use of modern motor materials, design techniques and new manufacturing methods. You also get more power in a smaller package — and clean, streamlined motor styling to add modern appearance to the equipment these new motors drive.

This new styling is completely functional. Ventilating grilles, for example, blend into the general motor design — yet they provide better

protection, greater safety, admit more cooling air.

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LA-102



NEMA D-flange Motor



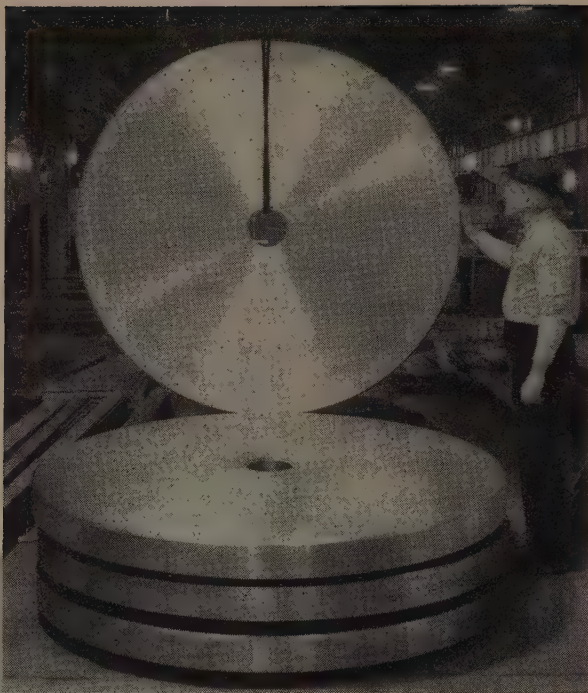
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NEMA C-flange Motor

*We specialize in SPECIAL MOTORS —
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There's a Louis Allis special motor for your toughest application. Whatever electrical or mechanical modifications you need, check first with Louis Allis.



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No matter how you look at it, these heavy gauge Blanks are unusual.

Unusual because they are made of Type 302 stainless steel. Unusual because they are 5" thick x $7\frac{3}{4}$ " ID x $78\frac{1}{2}$ " OD and weigh approximately 7000 pounds each. Unusual because each required special cutting and machining to produce its rough machined shape. But such jobs are not unusual at G. O. Carlson, Inc.

As specialists in working stainless steel, Carlson provides an unique service for you

...by having skilled workers produce your stainless shapes.

...by making full use of the specialized cutting and machining equipment at Carlson.

...by giving you exactly what you want "on time" to keep your production running smoothly.

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District Sales Offices in Principal Cities

tions for use of industrial control motors with globe, adjustable pitch, butterfly valves or combination. FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Steel Flooring Plates

Flash-Stone Co. Inc.—An illustrated 16-page catalog describes Ancor rolled steel flooring plates and their uses in armoring heavy-duty industrial concrete floors. Design characteristics which prevent buckling, curling or cracking and eliminate slippery surfaces and noise are described. A series of photographs illustrates installation procedure.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Core Dryer Bulletin

Allis-Chalmers Mfg. Co.—How to make better cores in less time at lower cost with Foundromax sand core dryer is told in a 1-page bulletin. Important features of the core dryer which result in simplified core making are defined. How such drying fits existing setups is explained. Answers are also supplied to 19 commonly asked questions concerning the operation.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Strip Feed Press

Baldwin-Lima-Hamilton Corp.—The No. 401 Hamilton strip feed press for high speed production of can ends, screw caps and other light stampings is presented in the new, 4-page bulletin No. 1352. Design, operation and specifications are given.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Electric Industrial Trucks

Yale & Towne Mfg. Co.—How to get the most out of walkie-type electric industrial trucks is presented in revised Bulletin P-103, available from the Materials Handling Division. A cartoon technique illustrates the points. The 16-page booklet is intended to serve as a guide for the efficient operation and trouble free maintenance of the Worksaver Electric Trucks.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Alloy Tubing Steel

Babcock & Wilcox Co.—Tubular Products Division offers bulletin TDC 151, discussing alloy tubing steels used in elevated temperature service. The bulletin discusses



EDITORIAL
REPRINT:

ing pictorially their range of hydraulic power and pressure processing equipment. 19 different types of hydraulic presses and machines are included. With each listing is a photo of the machine and a brief summary of its uses and sizes.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Grinding Attachment

Carborundum Co. — With announcement of the 61 Universal Backstand Idler attachment for all types of wall, bench and floor coated abrasive backstand grinding and polishing operations, the company offers a folder describing its advantages. Adaptability, durability and price are covered.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Copper Tubing

Superior Tube Co.—Properties, applications and advantages of seamless and Weldrawn Beryllium copper tubing are presented in Data Memorandum No. 7-2. Mechanical and physical properties, heat treating procedures, welding and brazing methods, pickling solution, corrosion resistance tables, standard production limit tables and tubing tolerances are listed.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

Handling Cost Cutter

Automatic Transportation Co.—How properly-planned materials handling can reduce production costs is explained in a nontechnical guide, "The Materials Handling Cost Cutter," edited to help the general businessman analyze his own materials handling problems.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

Copper Strip

Penn Precision Products Inc.—A publication makes available complete data for specifying beryllium copper precision strip. A discussion of available alloys, conditions and tempers is included, with tables covering available sizes and properties.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Indicating Recorders

Thermo Electric Co. — Bulletin No. 60 illustrates and describes the Thermo Electronic indicating recorder. 8 pages cover the two types, the potentiometer pyrometer and resistance thermometer, their construction features and specifications.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Guaranteed Annual Wage

Top topic at forthcoming labor management bargaining sessions will be the guaranteed annual wage, or, more accurately, supplementary unemployment compensation. The issue is widely misunderstood. Its cost implications are serious. The steelworkers' Dr. J. McDonald has presented the union's case for the GAW to be clearly define the issue for Steel readers.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Leasing

A sound re-equipment program can increase efficiency, lower costs. Over-age, obsolete and inefficient machinery bulks suprisingly large in American industry because of inflation, unsatisfactory government depreciation rules and management inertia. Leasing may be one way to modernize your plant. Not every one should lease, but everyone should consider the possibilities—which are outlined in three-part STEEL series concluding in this issue.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

Modern Heat Treating

New heat treating furnaces and methods of using them can be laid down on materials and processing costs. Dr. Allen G. Gray, ST Technical Editor, tells why. This is the leadoff article in a series that will present the latest technology of each of the modern heat treating processes.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

Machining Stainless

This is the second of two articles on the subject prepared by J. Armour, Union Drawn Steel Division, Republic Steel Corp. Armour says the machining standard test parts in automatic screw machines enables researchers to combine operations and proximate experience of an average user. He includes a diagnosis of 274 tool headaches.

FOR MORE DATA CIRCLE NO. 49 ON REPLY CARD

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3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

4-12-54

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April 12, 1954

Market Outlook

STEEL INGOT production in the week ended yesterday lost the 1-point gain it achieved in the preceding week and slipped back to 68 per cent of capacity.

Which way will it go from here? There's a diversity of opinion. Some people think it's bound to sag some more. Others think there will be some pickup. You can find reasons for either answer, because there's a diversity of conditions across the country.

ABOVE THE AVERAGE—This diversity is reflected in steel ingot production rates in the various districts of the nation. In eight of the country's 13 districts, rates were above the national average in the week ended yesterday.

In the Chicago area at least two steel mills are rebuilding inventories of semifinished steel. Both found their reduction was carried too far.

HOPEFUL—On the West Coast, H. H. Fuller, president, Bethlehem Pacific Coast Steel Corp., says he expects increased steel demand to push its second-quarter operating rate above that of the first quarter.

Also on the West Coast, March was an improved month for bolts and nuts. The bolt and nut industry is considered a good barometer of business conditions, for fasteners are used only in conjunction with other material. The bolt and nut business was one of the very first to feel the present business decline.

IMPROVEMENT—Another industrial segment that felt the business decline early—the wire mills—is noting an improvement. In the East, wire volume, mostly in manufacturers' grades, is close to 10 per cent ahead of the early first-

quarter rate. Not only are April orders improved, but some tonnage is being placed for May delivery. Bulk of the volume is for prompt shipment, however. This indicates a growing number of users have worked stocks down.

LOW LEVEL—At extremely low level is steel buying for railroad usage. This inactivity stems from the drop in the railroads' business. Freight car loadings thus far this year are 12 per cent below those of the comparable period of 1953.

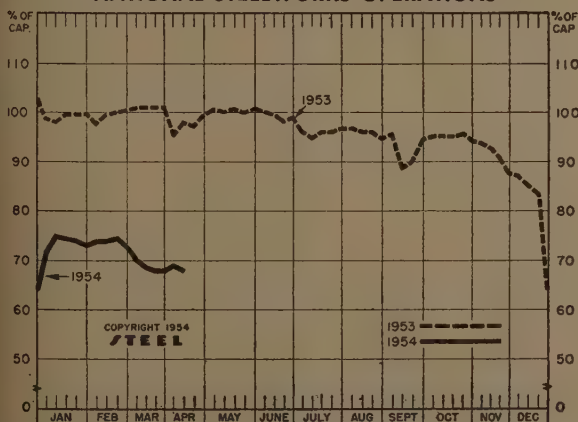
Other industrial groups are buying steel but only in small quantities, many mills and warehouses complain.

PRICE CUTS—The lowered demand for steel continues to sharpen competition for business, and scattered price cuts are resulting. In the East, one producer lowered hot-rolled and cold-rolled carbon steel sheets \$1.50 a net ton. As a result, STEEL's price composite on finished steel is \$113.70 a net ton, down 3 cents. Other changes in domestic prices include the abandonment of a stress-relieving price extra of 1.25 cents a pound on five grades of the chromium-type stainless steel billets and bars.

IMPORT PRICES FALL—Pressure on prices extended to imported steel also, prices on several leading grades of steel from the western European countries being down substantially.

The steelmaking scrap market, often regarded as a barometer of activity in the steel industry, saw prices go up a bit in the week ended Apr. 8. As a result, STEEL's price composite on steelmaking grades of scrap rose for the second consecutive week. A 17-cent rise put the index up to \$24.50 a gross ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 11	Change	Same Week 1953	1952
Pittsburgh	71	- 4*	97.5	62
Chicago	73.5	- 5.5*	106	52.5
Mid-Atlantic	62	+ 1	98.5	78
Youngstown	69	- 1	105.5	40
Wheeling	74.5	+ 7	101	89
Cleveland	68.5	+ 11	104	48.5
Buffalo	67.5	0	106.5	35
Birmingham	77	+ 1.5	101	50
New England	51	- 14	91	67
Cincinnati	69	+ 2	98.5	60
St. Louis	82.5	+ 0.5	71.5	73.5
Detroit	65	- 23	109	91
Western	77	+ 1	110	89.5
National Rate	68	- 1	98	61.5

INGOT PRODUCTION†

	Week Ended Apr. 11	Week Ago	Month Ago	Year Ago
INDEX	101.2†	102.6	102.3	138.8
(1947-1949=100)				
NET TONS	1,626†	1,648	1,652	2,230
(In thousands)				

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,384,549 in 1954;
2,254,459 in 1953; 2,077,040 in 1952.

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	\$4.400	Bars, H.R., alloy	\$8.575	Strip, C.R., stainless, 430 (lb)	\$0.415	Tin plate, hot-dipped, 1.25 lb	\$3.80
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.33
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, butt-weld (100 ft)	14.454	Black plate, can making quality	6.33
Axles, railway	7.250	Bars, H.R., reinforcing	4.900	Pipe, galv., butt-weld (100 ft)	17.731	Wire, drawn, carbon	7.03
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.960	Pipe, line (100 ft)	141.980	Wire, drawn, stainless, 430 (lb)	5.00
Plates, carbon	4.550	Bars, C.F., alloy	11.000	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	7.34
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	6.07
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	†	Wire, barbed (80-rod spool)	16.4
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	†	Woven wire fence (20-rod roll)	16.4
Bars, tool steel H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193	† Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 6	Mar. 30	Month	Mar.
	1954	1954	Ago	Average
(1947-1949=100)	140.9	140.9	140.9	140.9

STEEL'S FINISHED STEEL PRICE INDEX*

	Apr. 6	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	154.01
Index in cents per lb	5.140	5.140	5.140	4.912	4.172

STEEL'S ARITHMETICAL PRICE COMPOSITES

	Apr. 6	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Finished Steel, NT*	\$113.70	\$113.70	\$113.70	\$110.98	\$96.50
No. 2 Fdry, Pig Iron, GT	58.54	58.54	58.54	55.04	43.8
Basic Pig Iron, GT	58.04	58.04	58.04	54.66	41.8
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	43.4
Steelmaking Scrap, GT	25.33	24.50	24.17	43.33	23.0

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 1. *Of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 8	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, Std., del. Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.85
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.30
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.30
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.15-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.35
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.20
Tin plate (1.50 lb), box, Pitts.	\$8.95	\$8.95	\$8.95	\$8.95	\$7.75

SEMI-FINISHED STEEL

	Apr. 8	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Billets, forging, Pitts. (NT)	\$75.50	\$75.50	\$75.50	\$70.50	\$61.00
Wire rods, 1/2" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Apr. 8	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Bessemer, Pitts.	\$57.00	\$57.00	\$57.00	\$55.50	\$48.1
Basic, Valley	56.00	56.00	56.00	54.50	48.0
Basic, del. Phila.	59.68	59.68	59.68	59.25	50.0
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	47.0
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.0
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.0
No. 2 Fdry, del. Phila.	60.13	60.13	60.13	59.75	50.0
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.0
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.0
Malleable, Valley	56.50	56.50	56.50	55.00	46.0
Malleable, Chicago	56.50	56.50	56.50	55.00	46.0
Ferromanganese, Duquesne.	200.00†	200.00†	200.00†	228.00*	175.0*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

	Apr. 8	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
No. 1 Heavy Melt, Pitts.	\$26.50	\$25.50	\$25.50	\$44.00	\$26.0
No. 1 Heavy Melt, E. Pa.	22.00	22.00	22.00	44.50	21.0
No. 1 Heavy Melt, Chicago	27.50	26.00	26.00	41.50	25.0
No. 1 Heavy Melt, Valley	24.50	23.50	23.50	41.75	24.0
No. 1 Heavy Melt, Cleve.	21.50	20.50	20.50	42.00	22.0
No. 1 Heavy Melt, Buffalo.	23.50	24.00	24.00	46.00	25.0
Rails, Rerolling, Chicago	34.50	34.50	36.50	55.00	34.0
No. 1 Cast, Chicago	36.00	33.00	31.50	44.00	34.0

COKE, Net Ton

	Apr. 8	Week	Month	Year	5 Yrs.
	1954	Ago	Ago	Ago	Ago
Beehive, Furn, Connsvl.	\$14.75	\$14.75	\$14.75	\$14.75	\$14.0
Beehive, Fdry, Connsvl.	16.75	16.75	16.75	17.00	17.0
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.0

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 3, 5% Si, 23.10; No. 14, 12% Cu, 24.40; No. 19, 4.5% Cu, 0.8% Si, 22.70; No. 21, 3.8% Mg, 24.40; No. 35, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, \$71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, \$40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$1.70 per lb del.

Cobalt: 97-99%, \$2.60 per lb for 550 lb keg, \$2.62 per lb for 100 lb case; \$2.67 per lb under 100 lb.

Columbium: Powder, \$75.00 per lb, nom.

Copper: Electrolytic 29.75-30.00 del. Conn.

Valley, 29.875-30.125 del. Midwest; Loe 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, \$295 per lb nom.

Gold: U. S. Treasury, \$35 per oz.

Iridium: 99.9%, \$2.25 per troy oz.

Iridium: \$145-\$150 per troy oz.

Lead: Common 13.55, chemical 13.65, ch. roding 13.65, St. Louis; New York basis, 0.20.

Lithium: 98%, \$11-\$14 per lb, depending quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00 notched ingot 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 10,000 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ31C and alloys G, H, and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. A 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York \$210-\$215 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced \$3.40 per lb; pressed ingot \$4.06 per lb sintered ingot \$5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 and larger), unpacked 60.00; 25-lb pigs 62.00 "XX" nickel shot 63.65; "F" nickel shot

DAILY NONFERROUS PRICE RECORD

	Price Apr. 8	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1953
Copper	29.75-30.00	Mar. 3	29.50-30.00	29.865	29.750	30.755
Lead	13.55	Apr. 1	13.30	12.735	12.610	12.473
Zinc	10.25	Mar. 29	9.75	9.657	9.369	11.000
Tin	94.50	Apr. 7	94.25	92.518	85.181	102.567
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, del.; Magnesium 99.8%, Freeport, Tex.

for addition to cast iron, 60.00; prices Port Colborne, Ont., including import New York basis, add 0.92.
 at \$140-\$150 per troy oz. nom.
 um: \$21 per troy oz.
 um: \$34-\$37 per troy oz from refineries.
 at \$16-\$21.50 per mg radium content, ing on quantity.
 um: \$125 per troy oz.
 um: \$70-\$75 per troy oz.
 um: 99.5%, \$5-\$6 per lb.
 od: 16.50, carlots; 17.00 l.c.l.
 um: Sheet, rod \$39.00 per lb; powder \$33 per lb.
 um: \$1.75 per lb.
 um: \$12.50 per lb.
 tir: Straits, New York, spot, 94.50; prompt, 94.
 um: Sponge, 99.3+%, grade A-1 ductile (0. Fe max.) \$4.72; grade A-2 (0.5% Fe max.) \$4.46 per pound.
 um: Test: Powder, 98.8%, carbon reduced, 10 test \$4.65 per lb f.o.b. shipping point; less than 1000 lb \$4.30; 99+ % hydrogen reduced \$4.95. Treated ingots \$3.70.
 tir: Prime Western 10.25, brass special 10.50, immediate 10.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.60, special high grade 11.75, die casting alloy 14.25, del.
 um: Sponge \$10 per lb; powder electro grade \$15, flash grade \$11.50.
 (N: Chromium, manganese and silicon metals as listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS
 Aluminum Ingot: Piston Alloys 20.00-22.00; No. 2 foundry alloy (No. 2 grade) 19.50-20.00; 6% silicon alloy, 0.60 Cu max., 22.50-23.00; 13 alloy, 0.60 Cu max., 22.50-23.00; 20 alloy 21.50-22.50; 108 alloy 20.00-21.50; deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.75-21.75; grade 2, 19.20-25; grade 3, 18.50-19.25; grade 4, 18.49.00.
 Ingot: Red brass, No. 115, 25.00; tin bronze No. 225, 36.75, No. 245, 31.00; high lead tin bronze, No. 305, 29.75; No. 1 bronze, No. 405, 21.15; manganese bronze No. 42 26.25.
 Medium Alloy Ingot: AZ63A, 31.50; AZ91B, 27; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS
COPPER WIRE
 B: soft, f.o.b. eastern mills, 100,000 lb lots, 35; 30,000 lb lots, 35.48; l.c.l. 35.98. Weathered, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire del., 15,000 lb or m: 41.83; l.c.l., 42.68.
LEAD
 (ies to jobbers f.o.b. Buffalo, Cleveland, Pough.) Sheets, full rolls, 140 sq ft or m \$18.50 per cwt; pipe, full coils \$18.50 per cwt; traps and bends, list prices plus 30%.
TITANIUM
 (ies per lb, 100,000 lb and over, f.o.b. mill.) S: \$15; sheared mill plate, \$12; strip, \$16; S: \$10; forging billets, \$8; hot-rolled and rod bars, \$6.
ZINC
 S: 23.00, f.o.b. mill, 38,000 lb and over. R: on zinc in coils, 19.50-20.50, f.o.b. mill, 38,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM
 P: \$27; H.R. strip \$28; C.R. strip \$35; rod or H.R. bars \$27; wire, 0.015 in. f.o.b. per linear foot.
NICKEL, MONEL, INCONEL
"A" Nickel
 S: C.R. 86.5
 S: C.R. 92.5
 P: H.R. 84.5
 R: Shapes 82.5
 S: Less Tubes 115.5
 S: Blocks 80.0
Monel
 S: C.R. 87.5
 S: C.R. 93.5
 P: H.R. 86.5
 R: Shapes 83.5
 S: Less Tubes 115.5
 S: Blocks 80.0
Inconel
 S: C.R. 92.5
 S: C.R. 98.5
 P: H.R. 90.5
 R: Shapes 88.5
 S: Less Tubes 137.5
 S: Blocks 80.0

BASE METAL PRICES

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Rod	Clean Ends	Clean Turnings
Copper	46.38	45.98	44.44	48.44	26.00	26.00	25.25
Low Brass	41.72	33.50	42.22	44.93	19.75	19.50	18.00
Brass, 85%	45.44	45.38	45.98	48.25	23.00	22.75	22.50
Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Al Brass	45.76	40.07	52.30	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.61	23.875	23.625	23.125
Al Silver, 10%	55.38	59.43	57.69	.....	23.625	23.375	11.813
Alphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	26.875	24.875
Ion Bronze	52.71	51.90	52.75	70.11	25.125	24.875	24.125
ganese Bronze	49.48	48.82	54.06	.....	18.250	18.000	17.600
Alz Metal	43.96	39.77	.....	.....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 800 lb or more. b. Hot-rolled. c. Cold-drawn. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping at. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Lead.

ALUMINUM

Thickness	Range	Widths or Diameters	Flat Sheet	Coiled Sheet	Coiled Sheet
0.240-0.135	12-48	33.9	.....	.....	.....
0.135-0.098	12-48	34.4	.....	.....	.....
0.095-0.077	12-48	35.1	32.7	37.5	.....
0.076-0.061	12-48	35.7	32.9	37.7	.....
0.060-0.048	12-48	36.1	33.2	38.1	.....
0.047-0.038	12-48	36.8	33.6	38.4	.....
0.037-0.030	12-48	37.0	34.0	39.1	.....
0.029-0.024	12-48	37.6	34.3	39.6	.....
0.023-0.019	12-36	38.3	35.1	40.4	.....
0.018-0.017	12-36	38.1	35.7	41.3	.....
0.016-0.015	12-36	40.0	36.5	42.5	.....
0.014	12-24	41.0	37.5	43.8	.....
0.013-0.012	12-24	42.1	38.2	44.8	.....
0.011	12-24	43.1	39.4	46.4	.....
0.010-0.0095	12-24	44.3	40.5	48.0	.....
0.009-0.0085	12-24	45.6	41.9	50.0	.....
0.008-0.0075	12-24	47.1	43.2	51.8	.....
0.007	12-18	48.6	44.6	54.1	.....
0.006	12-18	50.2	46.0	59.1	.....

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	38.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	38.2	40.9
61S-T3	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	63.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.				
Dia. (in.) or across flats	Round 1 1/8-1 3/8	1 7/8-1 7/4	Hexagonal 1 1/8-1 3/8	1 7/8-1 7/4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	58.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.0
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolls				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in. in specific lengths 38-144 in. diameters 0.375-8 in.; rectangles and squares. Class 1, 50.2-38.4 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.			
Pipe: A.S.A. Schedule 40, alloy 638-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.			
Nom. pipe size, in.		Nom. pipe size, in.	
1/4	\$15.05	2	\$ 46.30
1/2	23.65	4	127.70
3/4	32.00	6	228.50
1	38.25	8	343.90

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.	.....
Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, 1/4-in. thick, widths 24-72 in. 144 in.	.....
Extrusion Stock: AZ31, Rectangles, 1/4 x 2 in. 69.20, 1 x 4 in. 63.00, Rod, 1 in. 68.00, 2 in. 62.50, Tubing, 1 in. OD x 0.065-in. 87.00, Angles, 1 x 1 x 1/4-in. 72.90, 2 x 2 x 1/4-in. 67.00, Channels, 5 in. 67.80, I-Beams, 5 in. 66.20.	.....

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)
 Aluminum: 2S clippings 12.00; low copper clippings 12.00; mixed clippings 10.00-11.00; old sheet 9.50-10.00; borings and turnings 6.50; pistons and struts 6.50; crankcases 9.50-10.00; industrial castings 9.50-10.00.
 Copper and Brass: Heavy copper and wire, No. 1 24.00; No. 2 copper 22.50; light copper 20.50; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 12.50; new brass clippings 11.00; No. 1 brass rod turnings 13.50; light brass 15.00; heavy yellow brass 13.50; new brass rod ends 15.00; auto radiators, unsweated 13.50; cocks and faucets 15.00; brass pipe 16.25.
 Lead: Heavy 10.50-11.00; battery plate 5.75-6.00; linotype and stereotype 12.75; electrolyte 11.00; mixed babbitt 12.50.
 Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.
 Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 18.00-19.00; rods 23.00-25.00.
 Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.
 Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 40.00-45.00.
 Zinc: Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
 Aluminum: 2S, 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S clippings 14.00-14.50; mixed clippings 14.00-14.50; old sheet 12.50-13.00; old cast 12.50-13.00; clean old cable, free of steel 15.00-15.50; borings and turnings 12.50-13.50.
 Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.
 Copper, Brass: No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; refinery brass (60% copper) per dry copper content 21.50-22.00; auto radiators, 15.50, nominal.
 INGOTMAKERS' BUYING PRICES
 (Cents per pound, carlots, delivered)
 Copper, Brass: No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; No. 1 composition borings 19.00-19.50; No. 1 composition solids 19.50-20.00; heavy yellow brass solids 15.00-15.25; yellow brass turnings 14.00-14.25; radiators 15.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes \$1.75 per lb.
 Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.
 Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.
 Tin: Bar or slab, less than 200 lb \$1.105; 200-499 lb \$1.09; 500-999 lb \$1.085; 1000 lb or more \$1.08.
 Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

REHICALS

Cadmium Oxide: \$2.15 per lb, in 100 lb drums. Chromic Acid: Less than 10,000 lb 23.50; over 10,000 lb 27.50.
 Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.
 Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-38,000 lb 10.60; 38,000 lb and over 10.35.
 Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.
 Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 28.00.
 Silver Cyanide: Cents per ounce, 16 oz 80.825; 100 oz 78.50; 25,000 oz and over 77.325.
 Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.
 Sodium Stannate: Less than 100 lb 70.6; 100-600 lb 56.3; 700-1900 lb 53.9; 2000-9900 lb 52.1; 10,000 lb or more 51.0.
 Stannous Chloride (Anhydrous): Less than 50 lb \$1.844; 50 lb \$1.224; 100-300 lb \$1.074; 400-900 lb \$1.049; 1000-1900 lb \$1.025; 2000-4900 lb 98.8; 5000-19,900 lb 92.7; 20,000 lb and over 86.6.
 Stannous Sulphate: Less than 50 lb \$1.264; 50 lb 96.4; 100-1900 lb 94.4; 2000 lb and over 92.4.
 Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Don't expect quick action on national stockpiling of metals. The government need be in no hurry. Mere announcement of its policy shored up the nonferrous market

QUICK action isn't likely on metals stockpiling.

The government plan to shore up the mining industry will be used as a sword as well as a shield. While no one wants to go on record with his explanation for the delay, it's really quite simple. Mere announcement of the new policy, carefully preplanned, is serving its purpose well.

Flip-Flop—It stirred up enough buying enthusiasm to yank the market off bottom. It jacked up sales, prices and producers' state of mind. All this came about without a cent being spent. Even details of the plan are lacking, yet in a month's time market sentiment has undergone a complete reversal.

Washington officials feel they must proceed carefully in adding tonnages of the 35-40 metals to the national stockpile. This way they hope to achieve maximum mileage from the dole in terms of economic benefit to metals.

Dangers—Immediate purchases not only would dry up funds but also risk further recurrence of depressed conditions. There's also danger of falsely stimulating prices that might entice producers to open up marginal facilities here or abroad.

Also awaited are lead and zinc tariff recommendations, expected Apr. 20. Stockpile planning must be meshed with recovery of these two metals, as they contributed largely to the need for government action. All signs point to an increase of about one cent a pound on each metal, despite free trade appeals by the administration.

Chile Cuts Copper Output

Production cuts in Chilean copper of 30 per cent have been effected; first-quarter output was off better than 17 per cent from last year's average. The 20,700 tons monthly now produced in Chile compares with about 29,500 tons monthly last fall.

With U. S. output now reduced by nearly 15,000 tons monthly, world supply is in the neighborhood of 182,000 tons, about matching current consumption. Offsetting the cuts is the fact that new facilities will be add-

ing over 12,000 tons a month to domestic supply by year end, though they are protected by government floor price contracts.

The new stockpiling program of the U. S. is hailed in Chile as opening up new possibilities for sale of additional quantities of copper to the

STEEL's Metal Price Averages for Mar., 1954 (Cents per pound)

Electrolytic Copper, del.	
Conn.	29.865
Lead, St. Louis	12.735
Prime Western Zinc,	
E. St. Louis	9.657
Straits Tin, New York ..	92.518
Primary Aluminum	
Ingots, del.	21.500
Magnesium, Freeport,	
Tex.	27.000
Nickel, f.o.b. refinery ..	60.000

U. S., says Bache & Co., New York. Its market letter points out that the Chilean government still exercises control over about 80,000 tons of unsold copper. Sale of 10,000 tons of this to Britain has been authorized with payment in pound sterling. A German trade mission is also reportedly seeking a substantial tonnage.

Aluminum Cans—When?

Aluminum companies have always eyed covetously the big market for metal cans—38 billion cans were shipped last year alone. Aluminum cans are under vigorous research by both aluminum firms and can companies, but so far no flux or welding material has been developed to match the processing speed of solder.

A poke at prices was taken last week at the American Management Association's Packaging Conference in Atlantic City, N. J., by John A. Warren, American Home Products Corp., New York. Said he, "Aluminum cans will not be a serious threat to tin cans until the price differential between aluminum ingots and aluminum sheet is narrowed to the same proportion as that between steel ingot and electrolytic tin

plate." Aluminum companies say this is primarily a matter of attaining sufficient volume to keep a mill running only canmaking stock.

Zinc News both Good and Bad

Zinc stocks in March topped a 200,000-ton mark for the first time in over seven years, but the rest of the statistical news was gloom. Shipments were highest since last July, unfilled orders highest since June. Daily average production slipped to 2296 tons and is considered under control. Total production vs. 71,186 tons, shipments 70,009 tons, stocks at month-end 201,071 tons and backlog 37,209 tons. High-grade zinc was the only category showing a stock increase, as special high grade, intermediate and prime western slipped slightly.

Market Memos

- Another demand for a 25-cent-per-hour wage increase faces nonferrous metals companies doing business with International Union of Mine, Mill & Smelter Workers. Past demands were proved bluffs.

- Aluminum scrap is edging deeper into shortage with increased exports and less industrial scrap being generated in form of clipping, borings and turnings. Higher ingot prices posted by secondary smelters and higher bids by dealers to get scrap are open evidences of the condition. About 14 per cent of our aluminum comes from secondary sources, and a shrinkage of up to 20 per cent is predicted for this sector in 1954.

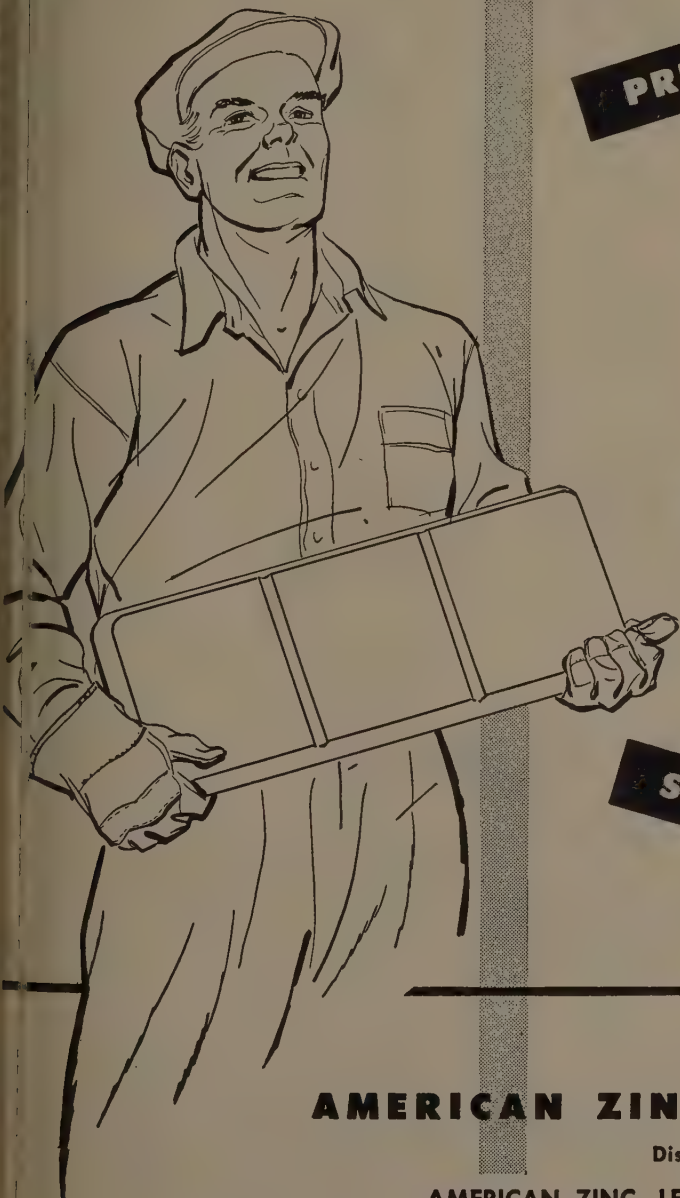
- Lead shipments are highest in many months, but batterymakers haven't hit their buying stride yet. Their big orders start coming along in May.

- Factors keeping tin in equilibrium are reopening of New York ports after the half-billion dollar strike, balancing gravity of developments in the Far East.

- Will there be a second stockpile subject to being unloaded on the market by executive order? The question was posed by Montana Senator Murray in asking ODM for clarification of the new stockpiling policy. He seeks guarantees that there will be no harm to the mining industry because of fluctuations in objectives.

every grade of ZINC
for urgent military and
civilian requirements

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 151. Key to footnotes, page 153.

SEMI-FINISHED

INGOTS, Carbon Forging (NT)

Fontana, Calif. K1	.....\$36.00
Munhall, Pa. U5	.....59.00

INGOTS, Alloy (NT)

Detroit R7	.....\$63.00
Fontana, Calif. K1	.....38.00
Midland, Pa. C18	.....62.00
Munhall, Pa. U5	.....62.00

BILLETS, BLOOMS & SLABS

Carbon Rolling (NT)

Alliquippa, Pa. J5	.....\$82.00
Bessemer, Pa. U5	.....62.00
Clairton, Pa. U5	.....62.00
Enslay, Ala. T2	.....62.00
Fairfield, Ala. T2	.....62.00
Fontana, Calif. K1	.....70.00
Gary, Ind. U5	.....62.00
Johnstown, Pa. B2	.....62.00
Lackawanna, N.Y. B2	.....62.00
Munhall, Pa. U5	.....62.00
So. Chicago, Ill. U5	.....62.00
So. Duquesne, Pa. U5	.....62.00

Carbon, Forging (NT)

Alliquippa, Pa. J5	.....\$75.50
Bessemer, Pa. U5	.....75.50
Buffalo R2	.....75.50
Clairton, Pa. U5	.....75.50
Cleveland R2	.....75.50
Conshohocken, Pa. A3	.....82.50
Detroit R7	.....78.50
Enslay, Ala. T2	.....75.50
Fairfield, Ala. T2	.....75.50
Fontana, Calif. K1	.....83.50
Gary, Ind. U5	.....75.50
Geneva, Utah C11	.....75.50
Houston S5	.....75.50
Johnstown, Pa. B2	.....75.50
Lackawanna, N.Y. B2	.....75.50
Los Angeles B3	.....85.00
Munhall, Pa. U5	.....75.50
Seattle B3	.....89.00
So. Chicago, Ind. U5, W14	.....75.50
So. Duquesne, Pa. U5	.....75.50
So. San Francisco B3	.....85.00

Alloy, Forging (NT)

Buffalo R2	.....\$82.00
Clairton, O. R2, T7	.....82.00
Conshohocken, Pa. A3	.....89.00
Detroit R7	.....84.00
Fontana, Calif. K1	.....101.00
Gary, Ind. U5	.....101.00
Houston S5	.....90.00
Ind. Harbor, Ind. Y1	.....82.00
Johnstown, Pa. B2	.....82.00
Lackawanna, N.Y. B2	.....82.00
Los Angeles B3	.....102.00
Midland, Pa. C18	.....82.00
Munhall, Pa. U5	.....82.00
So. Chicago, R2, U5, W14	.....82.00
So. Duquesne, Pa. U5	.....82.00
Struthers, O. Y1	.....82.00
Warren, O. C17	.....82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	.....\$92.50
Canton, O. R2	.....92.50
Cleveland R2	.....92.50
Fontana, Calif. K1	.....113.50
Gary, Ind. U5	.....92.50
Massillon, O. R2	.....92.50
So. Chicago, Ill. R292.50
So. Duquesne, Pa. U592.50

SHEET BAR (NT)

Fontana, Calif. K1\$93.18
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SKELP

Alliquippa, Pa. J53.85
Munhall, Pa. U53.75
Warren, O. R23.75
Youngstown R2, U53.75

WIRE RODS

Alabama City, Ala. R2	.....4.525
Alliquippa, Pa. J5	.....4.525
Alton, Ill. L1	.....4.70
Buffalo W12	.....4.525
Cleveland A7	.....4.525
Donora, Pa. A7	.....4.525
Fairfield, Ala. T2	.....4.525
Fontana, Calif. K1	.....5.325
Houston S5	.....4.925
Johnstown, Pa. B2	.....4.525
Joliet, Ill. A7	.....4.525
Kansas City, Mo. S9	.....4.865
Kokomo, Ind. C16	.....4.625
Los Angeles B3	.....5.325
Minneapolis, Colo. C10	.....4.775
Monessen, Pa. P7	.....4.525
No. Tonawanda, N.Y. B11	.....4.525
Pittsburg, Cal. C11	.....5.175
Portsmouth P12	.....4.525

Roebbing, N.J. R5	.....4.625
So. Chicago, Ill. R2	.....4.525
Sparrows Point, Md. B2	.....4.625
Sterling, Ill. (1) N15	.....4.525
Struthers, O. Y1	.....4.525
Torrance, Calif. C11	.....5.325
Worcester, Mass. A7	.....4.825

STRUCTURALS

Carbon Steel Stand. Shapes	
Alabama City, Ala. R2	.....4.10
Alliquippa, Pa. J5	.....4.10
Bessemer, Ala. T2	.....4.10
Bethlehem, Pa. B2	.....4.15
Clairton, Pa. U5	.....4.10
Fairfield, Ala. T2	.....4.10
Fontana, Calif. K1	.....4.75
Gary, Ind. U5	.....4.10
Geneva, Utah C11	.....4.10
Houston S5	.....4.50
Ind. Harbor, Ind. I-2	.....4.10
Johnstown, Pa. B2	.....4.10
Kansas City, Mo. S5	.....4.70
Lackawanna, N.Y. B2	.....4.15
Los Angeles B3	.....4.85
Minneapolis, Colo. C10	.....4.10
Munhall, Pa. U5	.....4.10
Niles, Calif. P1	.....4.80
Phoenixville, Pa. P4	.....4.15
Seattle B3	.....4.85
So. Chicago, Ill. U5, W14	.....4.10
So. San Francisco B3	.....4.75
Torrance, Calif. C11	.....4.80
Weirton, W. Va. W6	.....4.10

Wide Flange

Bethlehem, Pa. B2	.....4.15
Clairton, Pa. U5	.....4.10
Fontana, Calif. K1	.....5.10
Lackawanna, N.Y. B2	.....4.15
Munhall, Pa. U5	.....4.10
Phoenixville, Pa. P4	.....4.95
So. Chicago, Ill. U5	.....4.10

Alloy Stand. Shapes

Clairton, Pa. U5	.....5.00
Fontana, Calif. K1	.....6.40
Gary, Ind. U5	.....5.00
Munhall, Pa. U5	.....5.00
So. Chicago, Ill. U5	.....5.00

H.S., L.A. Stand. Shapes

Alliquippa, Pa. J5	.....3.175
Bessemer, Ala. T2	.....3.175
Bethlehem, Pa. B2	.....6.20
Clairton, Pa. U5	.....3.175
Fairfield, Ala. T2	.....3.175
Fontana, Calif. K1	.....6.825
Gary, Ind. U5	.....6.175
Geneva, Utah C11	.....6.175
Ind. Harbor, Ind. I-2	.....6.175
Ind. Harbor, Ind. Y1	.....6.675
Johnstown, Pa. B2	.....6.20
Lackawanna, N.Y. B2	.....6.85
Los Angeles B3	.....6.85
Munhall, Pa. U5	.....6.175
Seattle B3	.....6.90
So. Chicago, Ill. U5, W14	.....6.175
So. San Francisco B3	.....6.80
Struthers, O. Y1	.....6.675

H.S., L.A. Wide Flange

Bethlehem, Pa. B2	.....6.20
Lackawanna, N.Y. B2	.....6.20
Munhall, Pa. U5	.....6.125
So. Chicago, Ill. U5	.....6.125

PILING

BEARING PILES

Munhall, Pa. U5	.....4.10
So. Chicago, Ill. U5	.....4.10

STEEL SHEET PILING

Ind. Harbor, Ind. I-2	.....4.925
Lackawanna, N.Y. B2	.....4.925
Munhall, Pa. U5	.....4.925
So. Chicago, Ill. U5	.....4.925

PLATES

Plates, Carbon Steel	
Alabama City, Ala. R2	.....4.10
Alliquippa, Pa. J5	.....4.10
Ashland, Ky. (15) A10	.....4.10
Bessemer, Ala. T2	.....4.10
Clairton, Pa. U5	.....4.10
Cleveland, Del. C22	.....4.10
Cleveland J5, R2	.....4.10
Coatesville, Pa. L7	.....4.10
Conshohocken, Pa. A3	.....4.10
Ecorse, Mich. G5	.....4.30
Fairfield, Ala. T2	.....4.10
Fontana, Calif. (30) K1	.....4.75
Gary, Ind. U5	.....4.10
Geneva, Utah C11	.....4.10
Granite City, Ill. G4	.....4.30
Harrisburg, Pa. C5	.....4.10
Houston S5	.....4.50
Ind. Harbor, Ind. I-2, Y1	.....4.10
Johnstown, Pa. B2	.....4.10
Lackawanna, N.Y. B2	.....4.10

LoneStar, Tex. L6	.....4.40
Minneapolis, Colo. C10	.....4.95
Munhall, Pa. U5	.....4.10
Pittsburg, W. Va. W12	.....4.10
Riverdale, Ill. A1	.....4.10
Seattle B3	.....5.00
Sharon, Pa. S3	.....4.10
So. Chicago, Ill. U5, W14	.....4.10
Sparrows Point, Md. B2	.....4.10
Steelville, Mo. W10	.....4.10
Warren, O. R2	.....4.10
Weirton, W. Va. W6	.....4.10
Youngstown R2, U5, Y1	.....4.10

PLATES, Carbon Abras. Resist.

Fontana, Calif. K15.90
Geneva, Utah C115.25

PLATES, Wrought Iron

Economy, Pa. B149.30
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PLATES, High-Strength Low-Alloy

Alliquippa, Pa. J56.25
Bessemer, Ala. T26.25
Clairton, Pa. U56.25
Conshohocken, Pa. A3	.....6.25
Ecorse, Mich. G5	.....6.45
Fairfield, Ala. T2	.....6.25
Fontana, Calif. (30) K1	.....6.95
Gary, Ind. U5	.....6.25
Geneva, Utah C11	.....6.25
Ind. Harbor, Ind. I-2	.....6.25
Ind. Harbor, Ind. Y1	.....6.75
Johnstown, Pa. B2	.....6.25
Lackawanna, N.Y. B2	.....6.25
Munhall, Pa. U5	.....6.25
Pittsburg J5	.....6.25
Seattle B3	.....7.15
Sharon, Pa. S3	.....6.25
So. Chicago, Ill. U5, W14	.....6.25
Sparrows Point, Md. B2	.....6.25
Youngstown U5	.....6.25
Youngstown Y1	.....6.75

PLATES, Alloy

Claymont, Del. C22	.....5.55
Coatesville, Pa. L7	.....5.55
Fontana, Calif. K1	.....6.60
Gary, Ind. U5	.....5.55
Johnstown, Pa. B2	.....5.55
Munhall, Pa. U5	.....5.55
Sharon, Pa. S3	.....5.55
So. Chicago, Ill. U5, W14	.....5.55
Sparrows Point, Md. B2	.....5.55

FLOOR PLATES

Cleveland J5	.....5.15
Conshohocken, Pa. A3	.....5.15
Harrisburg, Pa. C5	.....5.15
Ind. Harbor, Ind. I-2	.....5.15
Munhall, Pa. U5	.....5.15
So. Chicago, Ill. U5	.....5.15

PLATES, Ingot Iron

Ashland c.l. (15) A10	.....4.35
Ashland c.l. (15) A10	.....4.85
Cleveland, c.l. R2	.....4.70
Warren, O. c.l. R2	.....4.70

BARS

BARS, Hot-Rolled Carbon

Alliquippa, Pa. J5	.....4.15
Alton, Ill. L1	.....4.35
Alton, Pa. A7	.....4.35
Bessemer, Ala. T2	.....4.15
Birmingham, Ala. C15	.....4.15
Buffalo (31) R2	.....4.18
Clairton, Pa. U5	.....4.15
Cleveland (31) R2	.....4.21
Detroit R7	.....4.30
Ecorse, Mich. G5	.....4.35
Emeryville, Calif. J7	.....4.90
Fairfield, Ala. T2	.....4.15
Fairless, Pa. U5	.....4.30
Fontana, Calif. K1	.....4.85
Gary, Ind. U5	.....4.15
Gadsden, Ala. (31) R2	.....4.18
Houston S5	.....4.55
Ind. Harbor, Ind. I-2, Y1	.....4.15
Johnstown, Pa. B2	.....4.15
Kansas City, Mo. S5	.....4.75
Lackawanna, N.Y. B2	.....4.15
Los Angeles B3	.....4.85
Milton, Pa. M18	.....4.15
Minneapolis, Colo. C10	.....4.60
Cleveland (31) R2	.....4.22
N. Tonawanda, N.Y. B11	.....4.15
Pittsburg, Calif. C11	.....4.85
Pittsburgh J5	.....4.15
Portland, Ore. O4	.....4.90
Seattle B3, N14	.....4.90
So. Chicago, U5, W14	.....4.15
Struthers, O. Y1	.....4.20
So. Duquesne, Pa. U5	.....4.15
So. San Fran., Calif. B3	.....4.90
Sterling, Ill. (1) N15	.....4.15
Struthers, O. Y1	.....4.15
Torrance, Calif. C11	.....4.85
Weirton, W. Va. W6	.....4.15
Youngstown U5	.....4.15
Youngstown (31) R2	.....4.20

BARS, Hot-Rolled Alloy

Bethlehem, Pa. B2	.....4.875
Buffalo R2	.....4.875
Canton, O. R2, T7	.....4.875
Clairton, Pa. U5	.....4.875
Detroit R7	.....4.975
Ecorse, Mich. G5	.....5.075
Fairless, Pa. U5	.....5.075
Fontana, Calif. K1	.....5.925
Gary, Ind. U5	.....4.875
Houston S5	.....5.275
Ind. Harbor, Ind. I-2, Y1	.....4.875
Johnstown, Pa. B2	.....4.875
Kansas City, Mo. S5	.....5.475
Lackawanna, N.Y. B2	.....4.875
Los Angeles B3	.....5.925
Massillon, O. R2	.....4.875
Midland, Pa. C18	.....4.875
Monaca, Pa. S17	.....4.875
Newark, N.J. W18	.....4.875
Plymouth, Mich. P5	.....4.875
So. Chicago, Ill. R2, W14	.....4.875
So. Duquesne, Pa. U5	.....4.875
Struthers, O. Y1	.....4.875
Warren, O. C17	.....4.875
Youngstown U5	.....4.875

BARS & SMALL SHAPES, H.R.

High-Strength Low-Alloy

Alliquippa, Pa. J5	.....6.225
Bessemer, Ala. T2	.....6.225
Bethlehem, Pa. B2	.....6.225
Clairton, Pa. U5	.....6.225
Ecorse, Mich. G5	.....6.425
Fairfield, Ala. T2	.....6.225
Fontana, Calif. K1	.....6.975
Gary, Ind. U5	.....6.225
Ind. Harbor, Ind. Y1	.....6.725
Ind. Harbor, Ind. I-2	.....6.225
Johnstown, Pa. B2	.....6.225
Lackawanna, N.Y. B2	.....6.225
Los Angeles B3	.....6.925
Massillon, O. R2	.....6.225
Midland, Pa. C18	.....6.225
Monaca, Pa. S17	.....6.225
Newark, N.J. W18	.....6.225
Plymouth, Mich. P5	.....6.225
So. Chicago, Ill. R2, W14	.....6.225
So. Duquesne, Pa. U5	.....6.225
So. San Francisco B3	.....6.975
Struthers, O. Y16.225
Youngstown U56.225

BAR SIZE ANGLES; H.R. CARBON

Bethlehem, Pa. B24.35
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BAR SIZE ANGLES: S. Shapes

Alliquippa, Pa. J54.15
Atlanta, Ga. A74.35
Niles, Calif. P14.85
San Francisco S7	.....5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton, Pa. U5	.....5.80
Fontana, Calif. K1	.....5.925
Gary, Ind. U5	.....5.80
Houston S5	.....5.60
Kansas City S5	.....5.60
Youngstown U5	.....5.00

BARS, Cold-Finished Carbon

Bridge, Pa. W18	.....5.20
Beaver Falls, Pa. M12, R2	.....5.20
Buffalo B5	.....5.25
Camden, N.J. P13	.....5.65
Carnegie, Pa. C12	.....5.20
Chicago W18	.....5.20
Cleveland A7, C20	.....5.35
Detroit P17, R7	.....5.35
Donora, Pa. A7	.....5.20
Elyria, O. W8	.....5.20
Franklin Park, Ill. N5	.....5.20
Gary, Ind. R2	.....5.20
Green Bay, Wis. F7	.....5.20
Hammond, Ind. L2, M13	.....5.20

[illegible]

STRIP, Cold-Finished	0.26-	0.41-	0.61-	0.81-	1.06-
Spring Steel (Annealed)	0.40C	0.60C	0.80C	1.05C	1.35C
Bridgeport, Conn. (10) S15	5.45	7.65	8.60	10.55	12.85
Bristol, Conn. W1			8.90	10.85	
Carnegie, Pa. S18		7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland, C7		8.90	8.60	10.55	12.85
Dearborn, Mich. D3	5.65	7.65	8.60		
Detroit D2	5.65	7.65	8.60	10.55	
Dover, O. G6	5.45	7.65	8.60	10.55	12.85
Franklin Park, Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison, N.J. C18			8.90	10.85	13.15
Indianapolis C8		7.80	8.60	10.55	
Mattapan, Mass. T6	6.10	7.95	8.90	10.85	13.15
New Brita, Conn. (10) S15	5.75	7.65	8.60	10.55	12.85
New Castle, Pa. B4	5.45	7.65	8.60		
New Castle, Pa. E5	5.45	8.00	8.60	10.55	12.85
New Haven, Conn. D2	5.90	7.95	8.90	10.85	
New York W3		7.95	8.90	10.85	13.15
Pawtucket, R.I. (11) N8		7.65	8.60	10.55	12.85
Pawtucket, R.I. (12) N8	6.10	7.95	8.90	10.85	13.15
Sharon, Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton, N.J. R5		7.95	8.90	10.85	13.15
Wallington, Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren, O. T6	5.45	7.65	8.60	10.55	12.85
Werkton, W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. T6	6.10	7.95	8.90	10.85	13.15
Worcester, Mass. W12		7.65	8.60	10.55	12.85
Youngstown C8					

Spring Steel (Tempered)					
Buffalo W12		12.50			
Bristol, Conn. W1		12.50	15.00		
Franklin Park, Ill. T6		13.25	15.75	18.75	
Harrison, N.J. C18		12.50	15.00	18.00	
New York W3		12.50	15.00	18.00	
Trenton, N.J. R5		12.50	15.00	18.00	
Worcester, Mass. W12		12.50	15.00	18.00	
Youngstown C8		12.50			
		12.85	15.35	18.35	

SILICON STEEL

H.R. SHEETS (22 gage)		Arma-	Elec-	Dyna-
(Cut Lengths)	Field	tura	tric	Motor
Beech-Brook, W.Va. W10		8.75	9.75	10.65
Brackenridge, Pa. A4		8.75	9.75	10.65
Indiana Harbor, Ind. I-2	7.85	8.15	8.75	9.75
Mansfield, O. D8	7.85	8.15	8.75	9.75
Newport, Ky. N9	7.85	8.15	8.75	9.75
Niles, O. N12	7.85	8.15	8.75	9.75
Vandergriff, Pa. U5	8.05	8.15	8.75	9.75
Warren, O. R2	7.85	8.15	8.75	9.75
Zanesville, O. A10		8.15	8.75	9.75

C.R. COILS & CUT LENGTHS, (22 Ga.)		Arma-	Elec-	Dyna-
(Semi processed 1/2c lower)	Field	tura	tric	Motor
Granite City, Ill. G4	8.25	8.60	9.20	10.20
Indiana Harbor, Ind. I-2	8.05	8.40	9.00	
Vandergriff, Pa. U5	8.05	8.60	9.20	10.20
Warren, O. R2	8.05	8.60	9.20	10.20

H.R. SHEETS (22 Gage)		Transformer	Grade	
(Cut Lengths)		T-72	T-65	T-52
Beech-Brook, W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge, Pa. A4	11.60			
Newport, Ky. N9	11.60			
Vandergriff, Pa. U5	11.60	12.15	12.65	13.65
Zanesville, O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS		T-100	T-90	T-80	T-73	T-72
(22 Ga.)						
Butler, Pa. A10				16.25	16.75	
Vandergriff, Pa. U5		13.65	14.65	15.25	16.75	13.55
Warren, O. R2						12.35

* Semi-processed. † Fully processed only. ‡ Coils annealed; semiprocessed 1/2c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)		0.25 lb	0.50 lb	0.75 lb
Alquippa, Pa. J5		\$7.15	\$7.65	\$8.15
Fairfield, Ala. T2		7.60	7.75	8.05
Fairless, Pa. U5		7.50	7.75	8.15
Gary, Ind. U5		7.40	7.65	8.05
Granite City, Ill. G4		7.60	7.85	8.25
Indiana Harbor, Ind. I-2, Y1		7.40	7.65	8.05
Irvin, Pa. U5		7.40	7.65	8.05
Niles, O. R2		7.40	7.65	8.05
Pittsburg, Calif. C11		8.15	8.40	8.80
Sparrows Point, Md. B2		7.50	7.75	8.15
Werkton, W.Va. W6		7.40	7.65	8.05
Yorkville, O. W10		7.40	7.65	8.05

TIN PLATE, American 1.25 1.50		lb		
Coke (Base Box)				
Alquippa, Pa. J5	\$8.70	\$8.95		
Fairfield, Ala. T2	8.80	9.05		
Fairless, Pa. U5	8.80	9.05		
Gary, Ind. U5	8.70	8.95		
Ind. Har. I-2, Y1	8.70	8.95		
Irvin, Pa. U5	8.70	8.95		
Pitts., Cal. C11	9.45	9.70		
Sp. Pt., Md. B2	8.80	9.05		
Warren, O. R2	8.70	8.95		
Werkton, W.Va. W6	8.70	8.95		
Yorkville, O. W10	8.70	8.95		

BLACK PLATE (Base Box)				
Alquippa, Pa. J5	\$8.50			
Fairfield, Ala. T2	8.60			
Fairless, Pa. U5	8.60			
Gary, Ind. U5	8.50			
Granite City, Ill. G4	8.70			
Ind. Harbor, Ind. I-2, Y1	8.60			
Irvin, Pa. U5	8.50			
Niles, O. R2	8.50			
Pittsburg, Calif. C11	9.25			
Sparrows Point, Md. B2	8.60			
Warren, O. R2	8.50			
Werkton, W.Va. W6	8.50			

YORKVILLE, O. W10		6.50

HOLLOWARE ENAMELING			
Black Plate (29 gage)			
Follansbee, W.Va. F4	6.10		
Gary, Ind. U5	6.10		
Granite City, Ill. G4	6.30		
Ind. Harbor, Ind. Y1	6.10		
Irvin, Pa. U5	6.10		
Yorkville, O. W10	6.10		

MANUFACTURING TERNES			
(Special Coated)			
Fairfield, Ala. T2	7.75		
Gary, Ind. U5	7.75		
Irvin, Pa. U5	7.75		
Yorkville, O. W10	7.75		

MANUFACTURING TERNES, 8 lb			
(Commercial Quality)			
Gary, Ind. U5	9.75		
Yorkville, O. W10	9.75		

MANUFACTURING TERNES, 17 lb			
(Coated, 6 lb)			
Yorkville, O. W10	8.65		
ROOFING STERN TERNES			
(8 lb Coated)			
Gary, Ind. U5	9.75		

WIRE

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. R2	5.525
Alquippa, Pa. J5	5.525
Alton, Ill. L1	5.70
Atlanta A11	5.70
Bartonsville, Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville, Ind. M8	5.625
Donora, Pa. A7	5.525
Duluth, Minn. A7	5.525
Fairfield, Ala. T2	5.525
Fostoria, O. (24) S1	5.75
Houston S5	5.925
Jacksonville, Fla. M8	6.05
Johnstown, Pa. B2	5.525
Joliet, Ill. A7	5.525
Kansas City, Mo. S5	6.125
Kokomo, Ind. C16	5.625
Los Angeles B3	6.475
Minneapolis C10	5.775
Monessen, Pa. P7	5.525
No. Tonawanda B11	5.525
Palmer, Mass. W12	5.525
Pittsburg, Calif. C11	6.475
Portsmouth, O. P12	5.525
Rankin, Pa. A7	5.525
So. Chicago, Ill. R2	5.525
So. Francisco C10	6.475
Sparrows Point, Md. B2	5.525
Sterling, Ill. (1) N15	5.625
Struthers, O. Y1	5.525
Waukegan, Ill. A7	5.525
Worcester, Mass. A7	5.525

WIRE, MB Spring, High Carbon

Alquippa, Pa. J5	6.925
Alton, Ill. L1	7.10
Bartonsville, Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora, Pa. A7	6.925
Duluth, Minn. A7	6.925
Fostoria, O. S1	6.925
Johnstown, Pa. B2	6.925
Los Angeles B3	7.875
Milbury, Mass. (12) N6	7.225
Minneapolis, Colo. C10	7.175
Monessen, Pa. P7, P16	6.925
Muncie, Ind. I-7	7.125
Palmer, Mass. W12	7.225
Pittsburg, Calif. C11	7.875
Portsmouth, O. P12	6.925
Roebing, N.J. R5	7.225
So. Chicago, Ill. R2	6.925
So. San Fran. C10	7.875
Sparrows Pt., Md. B2	7.025
Struthers, O. Y1	6.925
Trenton, N.J. A7	7.225
Waukegan, Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring

Alquippa, Pa. J5	6.625
Alton, Ill. L1	6.825
Buffalo W12	6.625
Cleveland A7	6.625
Donora, Pa. A7	6.625
Duluth, Minn. A7	6.625
Johnstown, Pa. B2	6.625
Los Angeles B3	7.575
Minneapolis, Colo. C10	6.80
Monessen, Pa. P7, P16	6.625
New Haven, Conn. A7	6.825
Palmer, Mass. W12	6.825
Pittsburg, Calif. C11	7.575
Portsmouth, O. P12	6.625
Roebing, N.J. R5	6.925
So. Chicago, Ill. R2	6.625
So. San Francisco C10	7.575
Sparrows Point, Md. B2	6.625
Trenton, N.J. A7	6.925
Waukegan, Ill. A7	6.625
Worcester, Mass. A7	6.925

WIRE, Fine & Weaving (8 Coils)

Alton, Ill. L1	10.15
Bartonsville, Ill. K4	10.15
Buffalo W12	10.15
Chicago W13	10.15
Cleveland A7	10.15
Crawfordsville, Ind. M8	10.15
Fostoria, O. S1	10.15
Jacksonville, Fla. M8	11.08
Johnstown, Pa. B2	10.15
Kokomo, Ind. C16	10.15
Minneapolis, Colo. C10	10.15
Monessen, Pa. P16	10.15
Muncie, Ind. I-7	10.15
Palmer, Mass. W12	10.15
Roebing, N.J. R5	10.15
So. San Francisco C10	10.90
Waukegan, Ill. A7	10.15
Worcester, Mass. A7, T6	10.95

WIRE, Galv'd ACSR for Cores

Bartonsville, Ill. K4	9.50
Buffalo W12	9.50
Johnstown, Pa. B2	9.50
Minneapolis, Colo. C10	9.25
Monessen, Pa. P16	9.50
Muncie, Ind. I-7	9.70
Portsmouth, O. D2	9.50

Roebing, N.J. R5	9.80
Sparrows Pt., Md. B2	9.80

ROPE WIRE

Alton, Ill. L1	9.45
Bartonsville, Ill. K4	9.35
Belo, W12	9.35
Fostoria, O. S1	9.35
Johnstown, Pa. B2	9.35
Monessen, Pa. P7, P16	9.35
Muncie, Ind. I-7	9.55
Palmer, Mass. W12	9.65
Portsmouth, O. P12	9.35
Roebing, N.J. R5	9.65
Sparrows Pt. B2	9.45
Struthers, O. Y1	9.35
Worcester, J4, T6	9.65

(A) Plow and Mild Plow

Add 0.25c for improved plow.

WIRE, Tire Bead

Alton, Ill. L1	12.75
Bartonsville, Ill. K4	12.65
Monessen, Pa. P16	12.55
Roebing, N.J. R5	12.85

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville, Ind. M8	7.55
Dover, O. G6	7.45
Fostoria, O. S1	7.45
Kokomo, Ind. C16	7.55
Franklin Park, Ill. T6	7.60
Massillon, O. R8	7.45
Monessen, Pa. P7, P16	7.45
Pawtucket, R.I. (12) N8	7.75
Trenton, N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality

(6 to 8 gage)	And'l. Gals.
Ala. City R2	6.675 7.075
Alquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonsville (48) K4	6.775 7.275
Buffalo W12	6.675 7.075
Cleveland A7	6.675
Crawfordsville M8	6.775 7.30
Donora, Pa. A7	6.675 7.075
Duluth, Minn. A7	6.675 7.075
Fairfield T2	6.675 7.075
Houston, Tex. S5	7.075 7.45
Jacksonville, Fla. M8	7.20 7.73
Johnstown B2 (48)	6.675 7.225*
Joliet, Ill. A7	6.675 7.075
Kansas City, Mo. S5	7.275 7.675
Kokomo C16	6.775 7.175
Los Angeles B3	7.625
Minneapolis C10	6.925 7.325*
Monessen P7 (48)	6.675 7.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rolling		Forging Billets	Seamless Billets	Shapes; H.R. & C.F.		C.R. Strip Flat Wire
	Ingots	Billets			Bars Wire	Plates	
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75
304L			36.75			42.75	45.25
308	19.50	25.50		36.25	37.00	37.50	42.00
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00
314						69.00	72.25
316		36.25	48.75	54.50	55.00	55.50	59.00
316L			52.50			61.00	64.25
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00
330			58.00			68.50	70.00
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25
403			27.00	30.75		32.00	34.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75
410	14.00	18.25	24.00	27.75	28.25	28.75	30.00
416			24.50	28.25	29.25	30.50	31.75
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50
430F		18.75	25.00	28.75		29.75	31.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50
440A,B,C		28.50	29.25	34.00		35.00	35.50
442			28.00			30.50	35.25
446			33.75	38.25	53.00	39.50	40.75
501			14.00	14.50	21.25	16.00	18.25
502			15.25	16.00	22.25	17.00	20.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wibur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Iron Tube Works Inc.; Firth Sterling Inc.; F. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div.; Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ulbrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates Carbon Base		Sheets Carbon Base	
	10%	20%	10%	20%
302	27.60	32.50-32.70	31.00	31.00
304	27.60	32.50-32.70	31.00	31.00
316	32.50	37.70-42.75	42.75	42.75
318	37.00	42.20		
321	29.30	34.40-37.00	37.00	37.00
347	30.40	35.50-40.50	40.50	40.50
405	23.40	30.60		
410	22.90	30.10		
430	22.90	30.10		
Inconel	41.23	54.18		165.00
Nickel	37.50	50.90		
Monel	33.90	51.80		
Copper*			46.00	

Copper*	Cold-Rolled Strip, Carbon Base		Hot-Rolled	
	10%	Both Sides	10%	Both Sides
Copper*			46.00	

* Deoxidized. Production points: Stainless sheets, W. Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville, Pa. J3; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	\$ per lb	Grade	\$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.19
Extra Carbon	0.30	W-Cr Hot Work	0.19
Special Carbon	0.35	V-Cr Hot Work	0.42-3
Oil Hardening	0.375	Hi-Carbon-Cr	0.865-0

Grade by Analysis (%)				Mo	\$ per lb
W	Cr	V	Co		
20.25	4.25	1.6	12.25		3.5
18.25	4.25	1	4.75		2.160-2.9
18	4	2			2.5
18	4	2			1.0
18	4	1			1.3
13.5	4	3			1.3
6	4.5	1.0			1.005-1.5
6	4	3		5	1.9
2	1.4	1.2		6	0.5
1.5	4	1		8.5	0.865-0.5

Tool Steel producers include: A4, A8, B2, B3, C4, 4, C18, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Gross Ton	No. 2 Basic Foundry	Malleable	Bessemer
Birmingham District			
Alabama City R2	52.38	52.88	
Birmingham R2	52.38	52.88	
Birmingham U6		52.88	
Woodward, Ala. W15	52.38	52.88	56.50†
Cincinnati, del.		60.43	
Buffalo District			
Buffalo R2, H1	56.00	56.50	57.00
Tonawanda, N.Y. W12	56.00	56.50	57.00
No. Tonawanda, N.Y. T9		56.50	57.00
Boston	66.65	67.15	67.65
Rochester, N.Y., del.	59.00	59.52	60.02
Syracuse, N.Y., del.	60.12	60.62	61.12
Chicago District			
Chicago I-3	56.00	56.50	57.00
Gary, Ind. U5	56.00		56.50
Indiana Harbor, Ind. I-2	56.00		56.50
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50
So. Chicago, Ill. U5	56.00		56.50
Milwaukee, del.	58.17	58.67	59.17
Muskegon, Mich., del.		62.80	62.87
Cleveland District			
Cleveland A7	56.00	56.50	57.00
Cleveland I-2	56.00	56.50	56.50
Akron, O., del. from Cleve.	59.00	59.25	59.75
Lorain, O. N3	56.00		57.00
Mid-Atlantic District			
Bethlehem, Pa. B2	58.00	58.50	59.00
New York, del.		62.23	62.73
Newark, del.	61.02	61.52	62.02
Birdsboro, Pa. B10	58.00	58.50	
Steelton, Pa. B2	58.00	58.50	59.00
Swedeland, Pa. A3	58.00	58.50	59.00
Philadelphia, del.	59.86	60.16	60.66
Troy, N.Y. R2	58.00	58.50	59.00
Pittsburgh District			
Neville Island, Pa. P6	66.00	66.50	67.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	58.37
McKees Rocks, del.	57.04	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.66
Verona, Trafford, del.	58.19	58.69	59.19
Brackenridge, del.	58.45	58.95	59.45
Bessemer, Pa. U5			56.50
Clairton, Rankin, So. Duquesne, Pa. U5	56.00		
McKeesport, Pa. N3	56.00		57.00
Midland, Pa. C18	56.00		
Monessen, Pa. P7	56.00		

Youngstown District

Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard, O. Y1		56.50	
Sharpsville, Pa. S6	56.00	56.50	57.00
Youngstown Y1		56.50	57.00
Youngstown U5	56.00		57.00
Mansfield, O., del.	60.90		61.40
Duluth I-3	56.00	56.50	57.00
Erie, Pa. I-3	56.00	56.50	57.00
Everett, Mass. E1	62.50	61.25	65.50
Fontana, Calif. K1	62.00	62.50	
Geneva, Utah C11	56.00	56.50	
Granite City, Ill. G4	57.90	58.40	58.90
Ironton, Utah C11	56.00	56.50	
LoneStar, Texas L6	52.00	52.50*	52.50
Minnequa, Colo. C10	58.00	59.00	59.00
Roadwood, Tenn. T3		56.50	57.00
Toledo, O. I-3	56.00	56.50	57.00
Cincinnati, del.	61.76	62.26	

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage there over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVER PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add \$1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	\$67.00
Buffalo H1	\$62.00

ELECTRIC FURNACE SILVER PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1.45 for each 0.5% Mn over 1%; \$2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	\$37.50
Keokuk, Iowa, Openheart & Fry, freight allowed K2	\$2.00
Keokuk, OH & Fry, 12 1/2 lb piglets, 16% Si, frt, allowed K2	\$5.00
Wenatchee, Wash. OH & Fry, freight allowed K2	\$2.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate A7	\$61.00
Rockwood, Tenn. T3	\$70.00
Steelton, Pa. B2	\$60.00
Philadelphia, del.	\$64.00
Troy, N.Y. R2	\$64.00

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STEEL
gives you.....

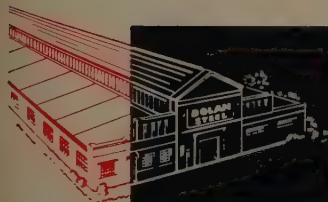
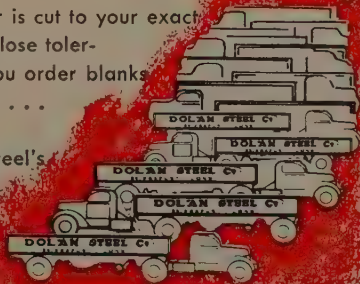
3d dimension
accuracy

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There's nothing new about 3-D at Dolan Steel—we've been producing it effectively for years. But here it means only one thing; and you see it not with special glasses, but with an accurate rule and micrometer.

Every coil of strip steel . . . every blank or strip you order is cut to your exact specifications — accurate in every dimension. Extremely close tolerances *actually give you more parts per ton*. And when you order blanks or strips, Dolan shears them to exactly the size you need . . . no scrap loss from cutting up large standard size pieces.

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DOLAN *Steel Company Inc.*

310 UNION AVE BRIDGEPORT 7, CONN.
PHONE 5-8123

NEW ENGLAND'S LARGEST STEEL WAREHOUSE, FLAT ROLLED STEEL, EXCLUSIVELY,
SERVING NEW ENGLAND, NEW YORK AND NEW JERSEY

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 15 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140†§		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17 ^a	12.04	6.98	6.85	7.98
Birmingham ...	6.10	7.00	8.00 ²	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.18	7.15	8.70	6.79	...	6.35	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	...	6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.30	7.11	8.00	6.66	...	6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.38	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50 ^a	....	6.50	6.36	7.79
Houston	7.15	7.60	9.23	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles ..	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.10	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59	...	6.45	7.57	11.77	6.63	6.60	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.78	7.52	8.37	7.16	...	7.06	8.43 ^a	11.99	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.00	...	7.00	8.50	....	7.00	7.00	7.85
Philadelphia ...	6.35	7.13	7.87	7.02	8.80	6.87	8.19 ^a	11.74	6.67	6.63	7.66 [†]
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg. .	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va. .	6.50	...	8.67	7.10	...	7.05	8.20	....	7.10	6.85	8.20
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco..	7.35	8.70	9.30	7.60	...	7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40 ⁷	9.80	7.60	...	7.60	10.55 ⁸	14.15	7.25	7.35	9.40
Washington ...	6.71	7.65	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **½-in. and heavier, add 0.34c for 12 gage and lighter. ††as annealed base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; 2—500 to 9999 lb; 3—1000 to 1999 lb; 4—1000 lb and over; 7—1500 lb to 3999; 8—under ½ in.

Distributor Adopts New Pricing Policy

Delivered prices are established by Brown-Wales Co. for every county and consuming point in New England states, excepting Connecticut. New policy stabilizes costs to users

Boston—New pricing policy initiated by Brown-Wales Co., with warehouses at Cambridge, Lewiston-Auburn, Me., and Hartford, Conn., in effect stabilizing delivered costs uniformly to consumers is being followed generally by distributors.

Based on the lowest truck rate from nearest competing warehouse, area delivered prices are readily established for every county and consuming point in all New England states, Connecticut excepted.

Boston, Worcester, Springfield, Providence, Portland, Me. and Nashua, N. H. are among points designated as metropolitan delivery areas with base prices for 2000-pound shipments; country price is 20 cents less per 100 pounds for all products. Delivery to Fitchburg, Mass., for instance, is figured on the Worcester metropolitan base, Holyoke, Mass., on Springfield and Mansfield, Mass., on metropolitan Providence.

Establishment of delivered prices on minimum truck rates from nearest warehouse area is the important stabilizing factor.

Pittsburgh—With stocks in balance warehouses are prepared for any upswing in orders second quarter may bring. Distributors report improvement in inquiries, especially from construction companies. Individual orders are low in tonnage

involved. Sales of plate and structural shapes are growing. Sheet demand is slow with consumers holding large inventories.

Cleveland—Sentiment among warehouse operators here is hopeful in spite of the fact order volume continues disappointing. Some distributors reported better March business than during February. Others, however, said their volume was off with consumers limiting purchases to prompt needs.

Prospects for improvement this month are considered only fair

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305....	\$4.55	\$4.55	\$4.50	\$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10' ..	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ½ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5 ..	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including \$2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt./Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	\$1.47/ft	\$1.51/ft	\$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2½ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2½ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Competition is keen and freight equalization, if anything, is on the increase. Warehouse base prices, however, except for floor plates, are unchanged. Floor plates now are quoted 7.63c f.o.b. Cleveland warehouse against 7.79c formerly quoted.

Cincinnati—Warehouse customers are buying cautiously and reducing inventories. The price situation is stable, quotations being shaded on liquidated stocks. Business is picking up slightly, however.

Chicago—Steel warehouse sales provide no pattern as to the future. Orders and tonnage stand at about the same levels as in March. There is some reason to believe a few sheet acquisitions are being made as a hedge against a possible steel strike this summer.

Philadelphia—While not on a level with last year, warehouse business is fairly active. March volume was somewhat better than that of February. As so far this month trading has picked up. Warehouse base prices are unchanged, but sheet price reductions by two district mills, and the recent moderate reduction leave the outlook still unsettled.

Waterbury, Conn.—Effective Apr. 1, the Chase Brass & Copper Co., subsidiary of Kennecott Copper Corp., begins merchandising stainless steel in sheet, bar, wire and tubing from its 27 warehouses and sales offices across the country through an arrangement with Crucible Steel Co. of America, Pittsburgh.

This move in no way affects the company's continued production and sale of brass and copper products.

San Francisco—Warehouses, encouraged by a slight pickup in March business, are anticipating a fairly good second quarter. Supplies are ample.

Los Angeles—For one warehouse, volume in March was 25 per cent greater than in February. With other distributors marking smaller but substantial gains, warehousemen are generally growing more optimistic.

Seattle—March warehouse order volume showed fair improvement over that for January and February. While inventories represent smaller investment than in recent years, they are well balanced. Some houses have added new products and sizes.

Bolts . . .

Bolt, Nut, Rivet Prices, Page 153

San Francisco—March was a good month for nuts and bolts. This is an old story of the steel business which usually precedes ups and downs for the industry, generally.

Some Prices Cut on Imported Steel

Reduction effected on major products, including sheets and plates, bars, reinforcing and building items. Importer sees 1.5 to 2 million tons brought in this year

New York—Prices on various steel products imported from western European countries are off substantially. Sheets and plates are down about 37 cents per 100 pounds here; at South Atlantic ports, 45 cents; Gulf ports, 42 cents; and on the West Coast, 47 cents.

Deformed bars have dipped from 20 to 30 cents at Eastern and Gulf ports, and 17 cents on the West Coast. Wide flange beams are easier by 14 cents per 100 pounds here and at Gulf and West Coast ports, and by 22 cents at South Atlantic ports.

Easing Noted—Merchant bars are lower by 10 to 20 cents, with greatest easing noted at South Atlantic and Gulf ports. On the other hand, barbed wire is up from 20 to 40 cents per 100 pounds. In bar sized angles, structural angles and I-beams, changes are relatively minor, up a little at some ports and down a bit at others. Wire rods show no change. The situation in nails is mixed. Seamless casing and tubing prices are steady.

Average Imports—Some 1.5 to 2 million tons of steel will be imported this year, predicts Kurt Orban, Kurt Orban Co. Inc. That's about what

comes in during an average year, he says, and he expects 1954 to be up to the average.

Greatest proportional growth in sales of imported steel has been in the South, largely because the southern area has had a big growth. Also, many ports in the South can be served cheaper by water from abroad than by rail from domestic mills.

Flexible Operators Out—A lot of the "flexible operators" are now out of the import business as the Detroit automotive slowdown meant loss of sheet and plate sales to importers. Today there are few structurals and bars going into the Great Lakes region either.

Chief products coming in at present are merchant wire items, particularly barbed wire and nails, structural steel and reinforcing bars, angles, channels and I-beams.

Largest Tonnage Item—Reinforcing bars are the largest tonnage item coming in. It's strictly a price matter, particularly in the smaller sizes. Intermediate grade rebar is priced at \$4.55 and size extras are practically nonexistent.

Quote Early Deliveries—European mills are quoting June delivery now



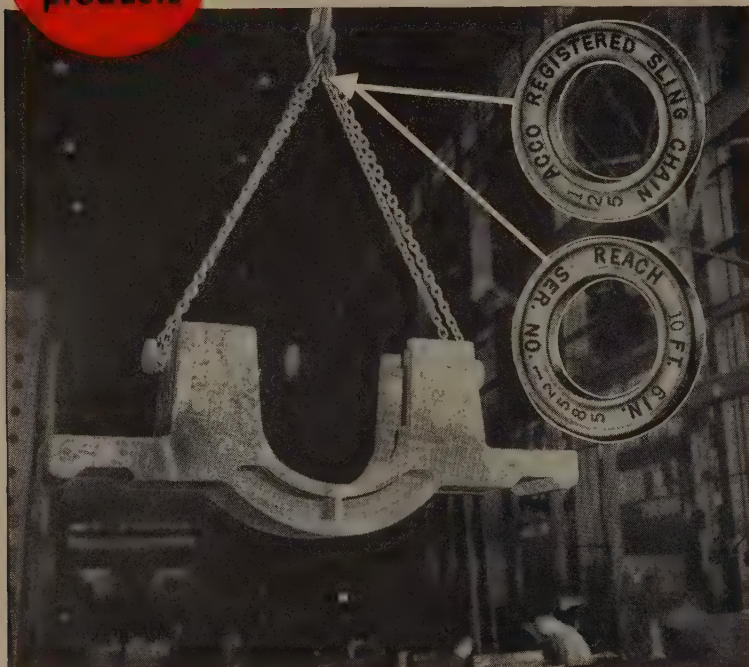
Open Hearth Performs for "First-Nighters"

First heat is poured at Detroit Steel Corp.'s new open hearth shop at Portsmouth, O.; 250 tons of steel can be handled by the bucket, which is lifted to the ingot molds by a 76 ft, 360-ton pouring crane. Modern blooming mill and ten new circular soaking pits were put into operation at the same time



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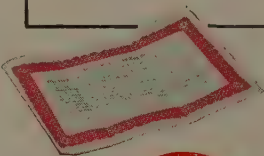


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Rings
Links
Hooks

on nails, late May on rebars, May on barbed wire, about 6 weeks on structural items.

Sheets, Strip . . .

Sheet and Strip Prices, Page 150 & 151

Philadelphia—Following the recent cut in hot and cold-rolled sheets .05 cents per pound by the Fairless, Pa. producer because of the change in competitive position resulting from the reduction in rail freight rates, the Conshohocken, Pa. producer has reduced hot-rolled carbon sheets .05 cent from 4.05c per pound to 3.97c, the same as the base for hot-rolled at Fairless.

The rate before tax, from Conshohocken to Philadelphia is 7 cents per 100 pounds for 80,000-pound carload and 8 cents for 40,000-pound carload against 9 cents and 10.50 cents from Fairless. From Conshohocken to New York it is 19 cents and 24 cents, compared with 16 cents and 20 cents from Fairless.

U. S. Steel Corp. has established mill base prices at its Fairless Works on its Cor-Ten hot and cold-rolled sheets, and Man-Ten hot-rolled sheets, production of which was started at the works beginning second quarter. Shipments will be of limited volume and size range during the initial period of production.

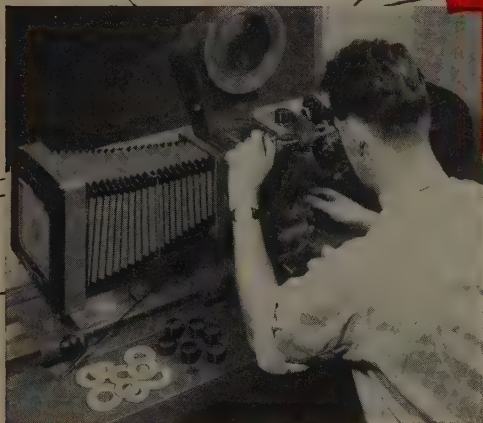
The base prices at Fairless are: Cor-Ten hot-rolled sheets, 5.95c; Cor-Ten cold-rolled sheets, 7.275c; Man-Ten hot-rolled sheets, 4.825c. These prices, which are \$1 per ton higher than at Pittsburgh, will result generally in lower delivered prices to the company's customers in the East Coast market in comparison with shipments from Pittsburgh and other U. S. Steel plant locations.

Boston—Changing specifications on flat-rolled requirements marks product production transfers among several larger consumers. General Electric, Westinghouse, Worthington and American Bosch are among plants involved with small motor air conditioning, aircraft engines, and other affected components, and appliances. Heavier volume of electrical silicon sheets in cut lengths rather than coils and other revisions in steel requirements will follow. More diversification is also a factor.

Gain in sheet and strip bookings is slight, excluding wasters, excess primes and tin mill black. There are openings in April schedules, including galvanized at most mills.

Among consumers, air conditioning is active.

Hot and cold-rolled sheets delivered



Quality control through metallurgy.

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*Through Wrought Washer Manufacturing Co., Milwaukee, Wisconsin

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ered Boston from Fairless, Pa. at 4.405c and 5.255c respectively.

New York—Of the major grade of sheets, cold-rolled are in best demand and there is room for improvement. Question continues whether April rollings will exceed March. Preponderance of opinion is April production will be some better, but few make definite predictions to that effect.

In recognition of the change in competitive position resulting from recent reduction in eastern railroad freight rates, the Fairless, Pa., producer has dropped prices \$1 a ton on hot and cold-rolled carbon sheets. This means a drop to 3.975c per pound for hot carbon sheets, 18 gage and heavier, and to 4.825c per pound for cold carbon sheets. The delivered New York prices on hot sheet are now 4.175c for 40,000-pound lot and 4.135c for 80,000-pound lots. Delivered prices on cold sheets here are 5.025c on 40,000-pound lots and 4.985c on 80,000-pound lots. These prices are predicated on freight rates before federal tax.

Pittsburgh—Cold-rolled sheet sale in early second quarter are near the low point of the year. Warehouse have large stocks. Pickup in sale to automakers is not expected before May, when other consumers are expected to complete inventory adjustment.

Cleveland—Sheet makers continue to report sluggish demand. Order volume has been disappointing ever since month this year and the outlook for May is not much improved. In fact, sellers think the sluggishness will hold pretty much through the first half of the year. Automotive demand for May is not coming out as had been expected.

St. Louis—Demand for galvanneal sheets sent Granite City Steel Co. capacity galvanizing operations last week. This followed doubling of its hot production a week earlier. Far roofing demand, already heavy, showing seasonal increase, which put the last of the company's four plants into operation.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Chicago—Business for steel reinforcing material continues good with inquiries for bids keeping sellers swamped. Much of the work is small but tonnage adds up to significant proportions. Despite this, keen competition makes for price concessions.

New York—While recent orders haven't been heavy, the outlook for reinforcing bars is promising. Road

A large, dark, industrial gravity drop hammer stands as the central background element. It has a tall, cylindrical upper section and a wider, tapered base. A worker in a cap and work clothes is positioned at the base of the machine, appearing to be operating or inspecting it. The machine's name, 'CHAMBERSBURG CECO-DROP', is faintly visible on its side.

The CECO-DROP makes other gravity drop hammers obsolete



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Let us tell you how you can help. Write for more details
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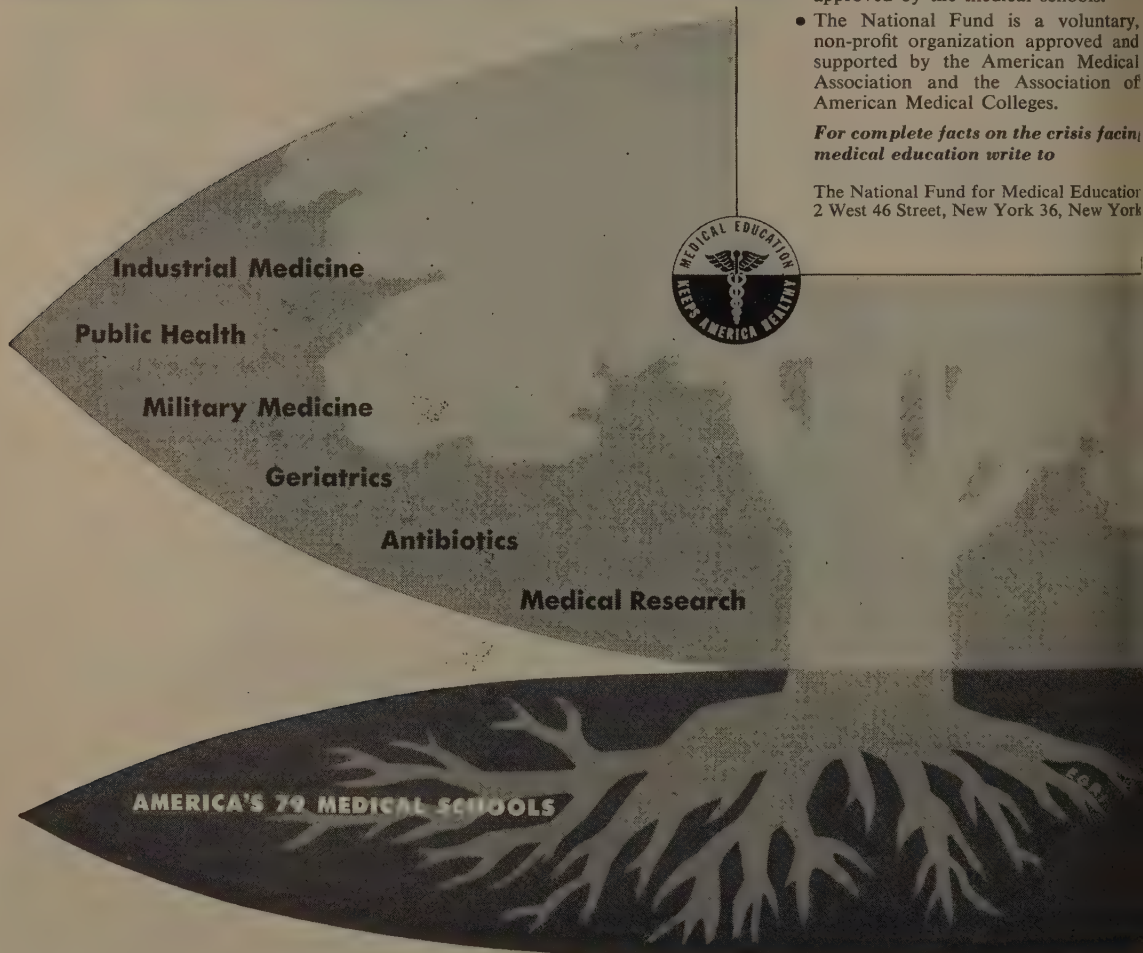
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- There are only 79 accredited medical schools in the United States.
- They train 82,000 undergraduate specialists and technicians and graduate 6,500 doctors annually.
- It costs from \$10,000 to \$12,000 to train a doctor today.
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- *ALL* 79 medical schools can be aided by a *single* gift to the National Fund for Medical Education.
- Contributions are distributed through annual grants according to a schedule approved by the medical schools.
- The National Fund is a voluntary, non-profit organization approved and supported by the American Medical Association and the Association of American Medical Colleges.

For complete facts on the crisis facing medical education write to

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work is expanding and there is considerable tonnage pending for schools, especially on Long Island. Los Angeles—The spring flood of engineering construction projects is giving a brisk tone to reinforcing bar demand.

Seattle — Rolling mill operations are sustained. Considerable small-lot tonnage has been booked, and backlogs are fairly stable.

Structural Shapes . . .

Structural Shape Prices, Page 150

Philadelphia—Shapes are moving at a good clip and competition among fabricators continues sharp. There is an accumulation of inquiry.

Pittsburgh — With construction projects requiring almost as much steel as last year, fabricators are increasing their orders. Wide flange beams and angles are in good supply.

Cleveland — Seasonal upswing in building and construction activity is being reflected in a strong demand for structurals and other building steel items. Along with merchant steel items and tin plate, building steel appears to be in most active demand of all major steel products. This in part is accounted for by the fact tight supply conditions that prevailed in structurals all last year prevented the building up of large stocks by fabricators.

Boston — Structural fabricating shops are buying less plain material from inventory. Backlogs average three and three months, but structural orders are mostly for fill-in. New freight rates do not apply to structurals and Pittsburgh tonnage is at a disadvantage of close to \$4.30 a ton. Less fabricated work is being eliminated with some decline in new contracts.

New York—Structural activity is undergoing further improvement. Bridge work is expanding and there is a greater diversification of tonnage generally. Fabricators anticipate a good first half, with the current quarter up seasonally from the month period just ended.

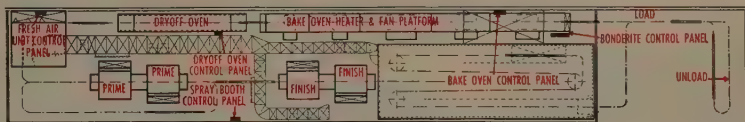
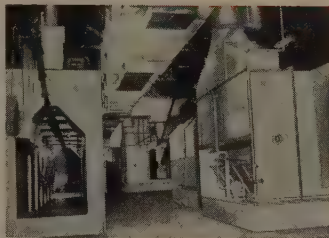
Chicago — Structural shapes are moving into the comfortable supply category along with other products. This is despite a good level of construction generally.

San Francisco—Considerable tonnage of structural shapes is going to ramps and freeways in this territory.

Seattle — Fabricators report business is improving. Small contracts are increasing in number. Growing competition is noted, in many instances contractors' bids being well



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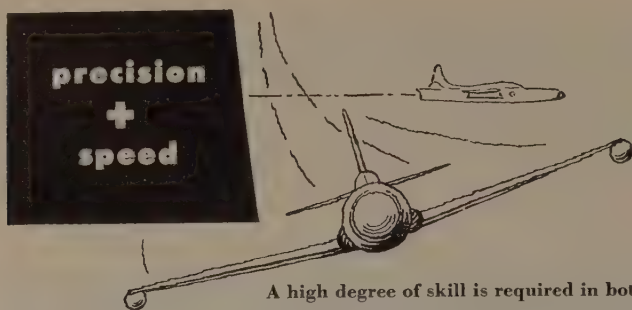
To meet these requirements, one manufacturer constructed a new plant in Alabama. When planning the plant layout, utmost consideration was given to installing the best and most efficient equipment. For the complete paint finishing operations, Peters-Dalton, Inc. was chosen. Illustrated here is a small part of this Finishing System—it was designed and installed by P-D engineers.

Space saving was of great importance, and layout for the practical flow and handling of parts and finishing required complete understanding of the manufacturer's needs. These were solved by P-D engineers. The system they installed is now functioning smoothly . . . and efficiently handling production requirements at minimum cost.

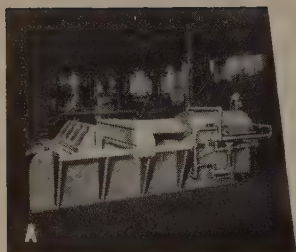
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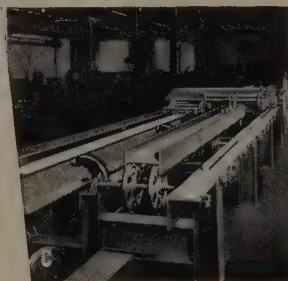


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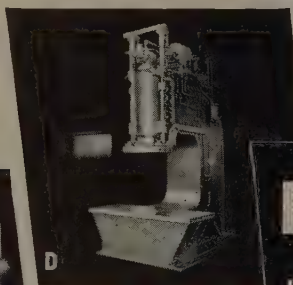
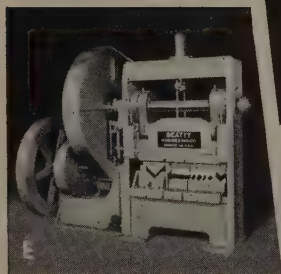
B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

C. BEATTY Spacing Table handles web and flange punching without roll adjustment.



D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.



within estimates. Several important jobs involving structurals are up for immediate action:

Wire . . .

Wire Prices, Page 152

Cleveland—Some seasonal improvement in merchant wire demand is noted. Sellers also report a little more activity in manufacturers wire and rods.

Boston—Orders are heavier, notably for manufacturers grades, and to some extent cold-heading stock. Not only are April orders improved over the previous month, but some tonnage is being placed for May.

New York—Reflecting the recent increase in the price of zinc, the United States Steel Export Co., subsidiary of U. S. Steel Corp., announced new export price bases on various wire products, freight included to New York, Philadelphia and Baltimore. Effective Mar. 30, the new prices are: Galvanized plain wire, \$6.98 per 100 pounds; barb wire, Glidden 4-pt 3-in. or 6-in., \$7.93; Iowa, 4-pt 3-in. or 6-in., \$7.93 and Waukegan, 4-pt 3-in. or 6-in., \$8.03; galvanized staples \$8.71.

Steel Bars . . .

Bar Prices, Page 150

Boston—Forge shops are pounding out less tonnage for automotive and defense products. The cutback in government contracts has hurt alloy consumption. Aircraft forging operations are maintained, but aluminum alloys account for the bulk of the metal used.

Stress relieving extra of 1.25 cents a pound on five grades of stainless steel billets and bars, 403, 405, 410, 416 and 416S, has been dropped.

First shipment of vacuum-melted steel has been made from Sanderson-Halcomb Works, Crucible Steel Co. of America, Syracuse, N. Y. The steel is being produced under Crucible-National Research Corp. agreement following purchase by Crucible of 50 per cent interest of Vacuum Metals Corp., Cambridge, Mass., subsidiary of National Research Corp.

Philadelphia — Hot-rolled carbon bar business is about the same. Sel-don, in recent years, has railroad buying been so dull. Miscellaneous demands, however, are not bad.

Pittsburgh—Seasonal improvement in sales to agricultural equipment producers are beginning to diminish. Most equipment required for sale this spring is already in stock. Sales of hot-rolled bars are slow.

Cleveland—With hot-rolled bars in easy supply there is a noticeable lack

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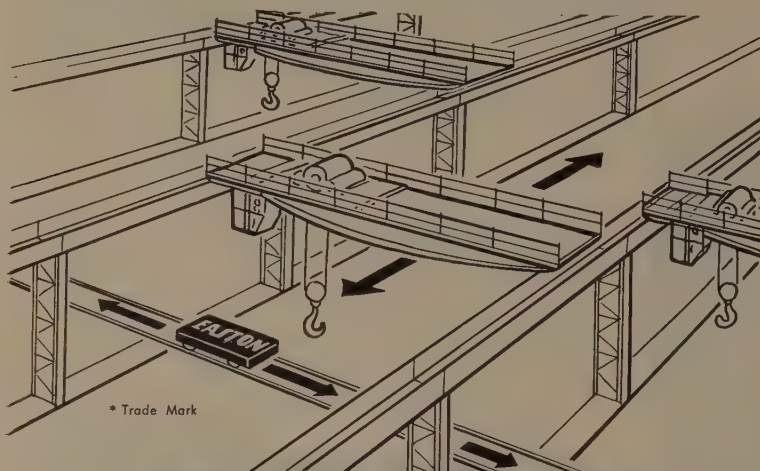
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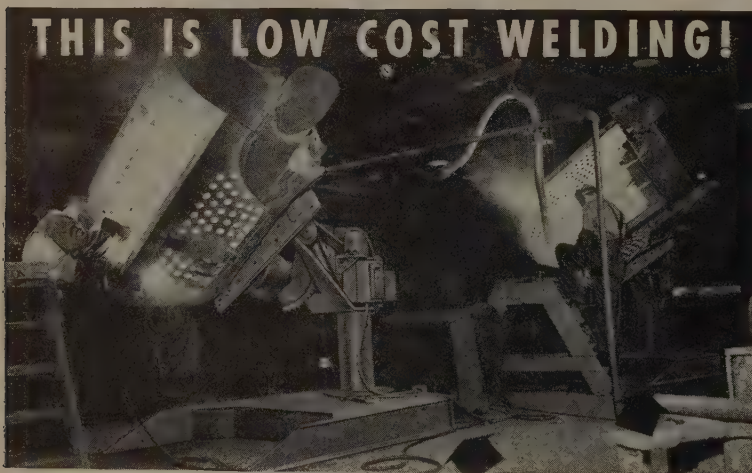
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of consumer pressure in the market. Since tonnage is available for quick shipment buyers are disinclined to order for inventory and, in some cases, stocks have not been completely liquidated.

Plates . . .

Plate Prices, Page 150

New York—Plate requirements for oil storage tanks are picking up a little, and this, combined with broadening in structural needs generally, is important in at least sustaining plate demand. Requirement for pressure vessels constitute a sustaining factor, offsetting the continued lag in railroad equipment and shipyard business. An increase in over-all demand—or at least an appreciable pickup, still awaits further reduction in consumer inventories.

Boston—Slightly improved demand for carbon plates is confined to the lighter gages. Tank work and miscellaneous shop fabricating accounts for the gain, held largely to specific requirements.

Philadelphia—Plate demand continues sluggish. Dearth of specifications from railroad equipment builders and shipyards is being particularly felt by district mills.

Pittsburgh—Improving weather for construction purposes boosts sales of plates to a good level. Small fabricators report a growing number of inquiries.

Birmingham—Plate demand continues relatively strong. Some newcomers to the industrial district say they are not being adequately supplied.

Seattle—Jobs involving plates consist mostly of municipal water storage tanks but several sizable projects will be placed shortly.

Semifinished Steel . .

Semifinished Prices, Page 150

Chicago—At least two mills in this area are building inventories of semifinished steel again. Both found the recent planned reduction was carried too far and that some rollings of various products were delayed because proper sizes or analyses of slabs, billets, etc., were not immediately available. Despite the build-up, there is a possibility ingot output in April may fall below that of March. The rate of 73.5 per cent for last week was the lowest for any week since the steel strike in mid-1952.

Philadelphia—Production of steel and pig iron at the Steelton, Pa. works of Bethlehem Steel Co. will be suspended Apr. 17 for several



20 YEARS OF KNOW-HOW

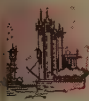
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weeks to permit reconstruction of the 44-inch blooming mill and also repairs in other sections of the rolling mill.

Coke production will be maintained to furnish requirements of the Harrisburg Gas Co., and also to provide gas for such continuing operations as are scheduled in the railroad equipment and structural fabricating shops of the company.

Sharon, Pa.—Sharon Steel Corp. took off one of the four open hearths it was operating at the Roemer Works at Farrell, Pa.

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**WIRE STRAIGHTENING
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Tin Plate . . .

Tin Plate Prices, Page 152

Washington—Shipments of metal cans in 1953 totaled 4,082,254 short tons, according to final figures by the Bureau of Census, Department of Commerce. This represented an increase of 6 per cent over 1952. Monthly shipments in 1953 ranged from a low of 192,403 tons in December to a high of 506,215 tons in August.

Cleveland—Tin mills are reported operating close to capacity to meet the strong seasonal demand coming in from canmakers. Currently, tin plate, along with wire, silicon sheets and stainless sheets, is among the few major steel products experiencing an upturn in demand over recent weeks.

Chicago—Canmakers appear to be making sure their operations won't get stymied in event of a steel strike this year. Their ordering of tin plate is keeping tin lines operating at a good clip and inventories are rising markedly.

San Francisco—Tin plate consumption in California this year is expected to reach between 750,000 and 760,000 tons. This would compare with about 700,000 tons consumed in

1953. California's beer industry, alone, is expected to need more than 60 million cans in 1954, compared with 550 million in 1953.

Tubular Goods . . .

Tubular Goods Prices, Page 153

New York—Business in merchant pipe is definitely more active, reflecting seasonal influences. Construction and building alterations and repairs are increasing, and demands for merchant pipe are expanding accordingly. This pickup is especially noticeable in butt-welded 1/2 to 4-inch range.

Boston—Merchant steel pipe distributors are buying small lots for prompt delivery, taking shipment out of stock within one week of some butt-welded and seamless sizes.

Pittsburgh—Producers expect demand for oil country goods to remain high through second quarter. Welded tubing sales, at a fair level for several months, may decline.

Seattle—Cast iron pipe demand is improving. Beaverton and Scappoose, Oreg., and Kent, Wash., have opened bids for unstated tonnages.

Iron Ore . . .

Iron Ore Prices, Page 173

Cleveland—Lake ore vessel operators are fitting out various ships for the lake fleet though the ore shipping season is not expected to really get under way until late April.

Canada . . .

Hamilton, Ont.—Steel Co. of Canada Ltd., reports 1953 sales at \$214,226,613 and net profit of \$14,257,444. This compares with sales of \$190,214,161 and net profit of \$13,163,444 in 1952.

The profit increase was largely due to replacement of high cost purchased steel with steel made in the company's own furnaces. Also, higher efficiency of modern equipment.

Stainless Steel . . .

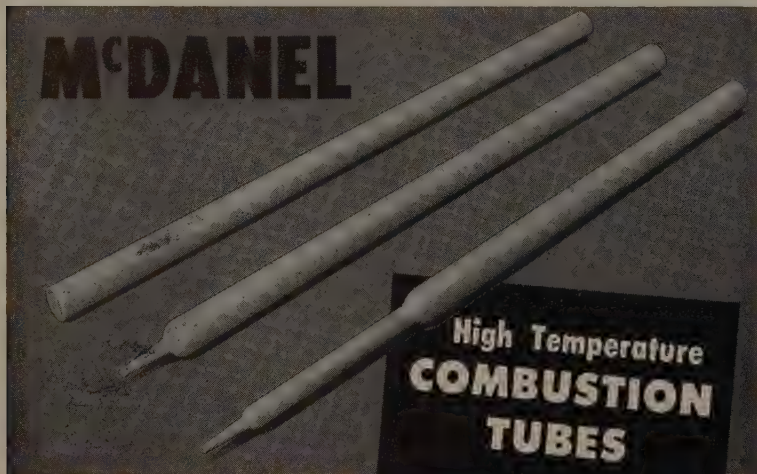
Stainless Steel Prices, Page 154

Pittsburgh—Strong first quarter improvement in sales failed to continue into April at the same rate. Now demand is declining.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1315 tons, industrial building, Sandvik Steel Co., Fairlawn, N. J., through Frank McBride, general contractor, to Lafayette Iron Works, Jersey City, N. J. 1250 tons, general shops, concentrating plant, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.; this is the second structural contract placed for the project recently.



Refractory Porcelain
Specialties in stock
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Write Today for 1954 Catalog
"McDanel Industrial Porcelains"

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

- 81 tons, replacement of metal storage building, Navy Yard, Brooklyn, through James Hart & Co., engineers, to Ditemza Co., New York.
- 62 tons, 17-story apartment, Manhattan, New York, through MacArthur Construction Co., to Schacht Structural Steel Inc., that city.
- 58 tons, Battelle Hall, state hospital, Middletown, Conn., to Connecticut Steel Co., New Britain; Wadhams & May Co., Hartford, Conn., general contractor.
- 40 tons, Convent of Our Lady of the Retreat, the Cernacle, Mt. Kisco, N. Y., through William A. Berbusse Jr. & Co. Inc., to Schacht Structural Steel Co. Inc., Long Island City, N. Y.
- 38 tons, No. 3 crane runway, General Electric Co., Pittsfield, Mass., to Schenectady Steel Co., Schenectady, N. Y.
- 24 tons, building, College of Sacred Heart, Weymouth, Mass., to A. O. Wilson Structural Steel Co., Cambridge, Mass.
- 24 tons, building, United States Rubber Co., Akron Heights, New York, through T. Stetzer & Son, general contractors, to W. H. Iron Works, that city.
- 20 tons, Bureau of Public Roads, bridge near Oakwood, Wash., to Bethlehem Pacific Steel Corp., Seattle, \$75,351.
- 14 tons, state bridge, Perry county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.
- 14 tons, one-story manufacturing building, Fairlawn Industrial Park Inc., Fairlawn, N. J., for occupancy by Fairbanks-Morse & Co., to Lafayette Iron Works, Jersey City, N. J.
- 14 tons, state bridge, Schuylkill county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.
- 16 tons, municipal filter building, Oradell, N. J., to Park Steel & Iron Co., a local fabricator.

STRUCTURAL STEEL PENDING

- 74 tons, 15-story apartment, 68th St. and Madison Ave., New York, bids in.
- 24 tons, 26 towers, knocked down with dynamite; bids to Corps of Engineers, Albuquerque, N. Mex.
- 24 tons, steel frame hangar, Gore Field, Great Falls, Mont.; bids to U. S. Engineer, that city, Apr. 20.
- 11 tons, wide flange, Navy; bids Apr. 16, to 7792-B, Washington.
- 11 tons, also 22 tons reinforcing bars, 210-ft steel truss bridge, Snohomish county, Washington; bids to Bureau of Public Roads, that city, Apr. 15.

REINFORCING BARS . . .

REINFORCING BARS PLACED

- 11 tons, 4-story addition to Bon Marche department store building, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Bennett Campbell Co. Inc., Seattle, general contractor.

REINFORCING BARS PENDING

- 6 tons, Garden State parkway, contract No. 1, sec. 1, Bergen county, New Jersey, bids Apr. 26; also 200 linear feet of 6 and 10-inch cast iron water pipe.
- 11 tons, T-beam Washington state highway bridge, Spokane county; bids to Olympia, that city, Apr. 20.

PLATES . . .

PLATES PENDING

- 3 tons, 1-million-gal tank, medical center, Federal prison, Springfield, Mo.
- 2 tons, 400,000-gal-tank, veterans' hospital, Waco, N. J.; bids May 4, Washington.

PIPE . . .

STEEL PIPE PLACED

- 24 tons, fabricated steel pipe, Public Service Electric & Gas Co., New Brunswick, N. J., to Colorado Fuel & Iron Corp. (Claymont, Del., plant) and National Tube Co.

RAILS, CARS . . .

RAILROAD CARS PLACED

- 6 tons, Railroad of New Jersey, four rail diesel cars, to Budd Co., Philadelphia.

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We Invite
Your
Inquiries

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton \$86, Palmerton, Pa.; \$87 Clairton and Duquesne, Pa. (16 to 19% Mn) \$84 per ton, Palmerton, Pa.; \$85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton \$200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Ore.; add or subtract \$2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump \$208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 12-15% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots \$1.35, less ton \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis, Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract \$177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract \$195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.I., lump, bulk 24.75c per lb of contained Cr; c.i. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 38.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.i. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.i. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload \$1.12, ton lots \$1.14; less ton \$1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, \$3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). \$3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) \$3.20.

Grainal: Vanadium Grainal No. 1, \$1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots \$1.23 per lb contained V₂O₅, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe). C.I. lump, bulk, regular 18.5c per lb of Si, c.i. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsilfer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.i. lump, bulk 8.0c per lb of alloy, c.i. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

Borasil: (3 to 4% B, 40 to 45% Si), \$5.25 per lb contained B, delivered to destination.

Boritan: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbotitan: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.1c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, C 1.50-3.0%). Contract, carload, lump, bulk 19c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3 3/4 each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 12.45c per lb of briquet, carload packed 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3 3/4 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.i. bulk 12.65c, per lb of briquet, c.i. packaged 13.4c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet, packed c.i. 7.10c, ton lot 8.2c, less ton 8.1c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.i. 6.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching. Small size only. Spot, add 0.25c.

Molybdo-Oxide Briquets: (Containing 2 1/2 lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or mo, \$3.80 per lb of contained W; 2000 lb W or 5000 lb W, \$3.90; less than 2000 lb W, \$4.1c. f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, \$9.50 per lb of contained Cb, less ton \$9.1c. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx. Ta 20% approx., and Cb and Ta 60% min, 0.30% max) ton lots, 2" x D, \$4.75 per lb of contained Cb plus Ta, deld.; less ton lot \$4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Contract, packed 1" x D, 45c per lb of alloy, ton 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-85%, Mn 5-7%, Zr 5-7, Fe 20% approx). Contract, carload, packed 1 1/2" x 12 M, 17.5c per lb of alloy, ton lot 18.25c, less ton 19.5c. Deld. Spot, add 0.2c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 11%). C.I. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19, Mn 8-11%). C.I. packed 16.6c per lb of alloy, ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; b Fe). Lump, carload, bulk 14.50c. Packed 15.50c, ton lots, 15.75c, less ton lots, 16.5c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% content with unitage of \$4 for each 1% of above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Sigio, Tenn \$90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, \$1.32 in all sizes except powdered which is \$1.41; Washington, Pa., furnace, any quantity \$1.32.

Technical Molybdo-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., \$1.14 in cans; bags, \$1.13, f.o.b. Langeloth, Pa.; Washington, Pa., \$1.13.

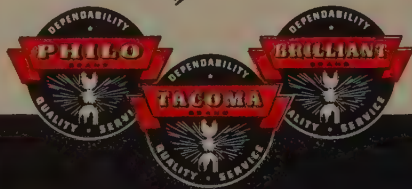


Gallery of the Best

Here at Ohio Ferro-Alloys Corporation we have a fine collection of quality ferro-alloys which help metal makers manufacture products to meet the exacting specifications of today's customers. Available in lump, crushed and briquet form, these ferro-alloys are readily obtainable from strategically-located plants and warehouses serving your area. Write for information on how we can help you solve your production problems.

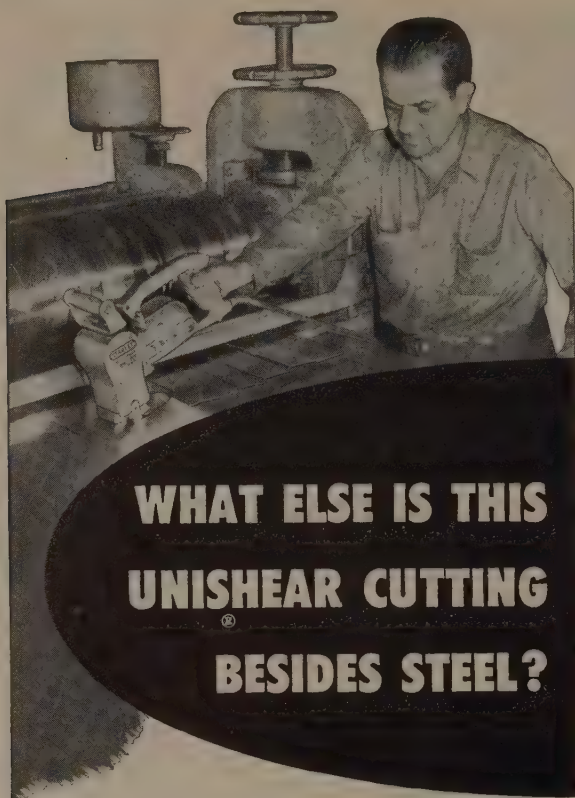
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This "extra cutting power" of the Stanley UNISHEAR was acquired by Dolan Steel Co., Bridgeport, Conn., when they switched from hand-snip operation to UNISHEARS. Says Mr. James A. Dolan, Jr., of Dolan Steel Co.: "We use the Stanley UNISHEAR to cut the leading edge of the roll, to trim out imperfections, and to cut after slitting. We have come to regard the UNISHEAR as invaluable. It is a tremendous improvement over the hand-snip method. Not only does the UNISHEAR do a smoother, cleaner job, it saves our men a lot of fatigue and effects a time-saving in operations."

Thank you, Mr. Dolan! Dolan Steel Co. uses the UNISHEAR model shown here. But you have your choice of six different portable models and two stationary. Also cutting attachments and accessories. A directory of Stanley Service Stations (there's one near you) is packed with every tool.

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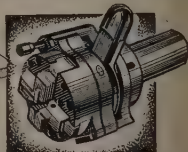


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A. W. Cadman Mfg. Co.

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ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

ces effective July 1, 1953, and thereafter;
s ton, 51.50¢ iron natural, rail of vessel,
r lake ports.)
range bessemer\$10.30
range nonbessemer 10.15
abl bessemer 10.05
abl nonbessemer 9.90
-hearth lump 11.15
phosphorus 9.90
foregoing prices are based on upper lake
freight rates, lake vessel freight rates,
liling and unloading charges, and taxes
e on which were in effect on June 24,
and increases or decreases after such
are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.
addy and basic 56-62% concentrates
ntract17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports
dish basic, 60 to 68% 20.00
h African hematite (spot)20.00-22.00
hilian iron ore, 65-69% (spot) 25.00

Tungsten Ore

Net ton unit, before duty
lign Wolframite, good commercial17.00-17.50
lastic scheelite, mine 63.00

Manganese Ore

48%, nearby, \$1.02-\$1.05 per long ton unit,
U. S. ports, duty for buyer's account;
7%, \$0.95-\$0.97.

Chrome Ore

s ton, f.o.b. cars, New York, Philadel-
Baltimore, Charleston, S. C., plus ocean
at differential for delivery to Portland,
Ct., or Tacoma, Wash.:

Indian and African

2:8:1\$40.00-\$42.00
3:1 44.00-46.00
no ratio 32.00-34.00

South African Transvaal

no ratio\$24.00-\$26.00
no ratio 34.00

Domestic

(Rail nearest seller)\$39.00

Molybdenum

hide concentrate, per lb. Mo content
nes, unpacked\$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard
9%\$2.40-\$2.80
min. \$3.40-\$3.50

Vanadium Ore

ents per lb. V₂O₅ content, deld. mills
estic\$1.00-\$1.20

REFRACTORIES

Fire Clay Brick

-Heat Duty: Pueblo, Colo., \$89; Ashland,
n. Hayward, Hinchins, Haldeman, Olive
Ky., Athens, Troup, Tex., Beech Creek,
rfield, Curwensville, Lock Haven, Lum-
Orviston, West Decatur, Pa., Bessemer,
Farber, Mexico, St. Louis, Vandalia,
Ironton, Oak Hill, Parral, Portsmouth,
Ottawa, Ill., Stevens Pottery, Ga., Wood-
be, N. J., \$109; Salina, Pa., \$114; Niles,
\$120; Los Angeles, Pittsburg, Calif.,
\$30.

Silica Brick

dard: Alexandria, Claysburg, Mt. Union,
Pa., Ensley, Ala., Portsmouth, O.,
Warren, O., Hays, Pa., \$120; Niles, O.,
E. Chicago, Ind. Joliet, Rockdale, Ill.,
Cutler, Utah, \$116.55; Los Angeles,
\$85.

Insulating Fire Brick

2" F: Massillon, O., \$178.50; Clearfield,
\$213; Augusta, Ga., Beaver Falls, Zel-
le, Pa., Mexico, Mo., \$206; Vandalia, Mo.,
\$10; Portsmouth, O., \$207.50; Bessemer,
\$212.80.

Ladle Brick

Pressed: Bessemer, Ala., \$64.60; Alsey,
Chester, New Cumberland, W. Va., Free-
Johnstown, Merrill Station, Pa., Wells-
O., \$77.50; Mexico, Mo., \$73.50; Clear-
Pa., Portsmouth, O., \$63; Perla, Ark.,
\$30; Los Angeles, \$110.25; Pittsburg, Calif.,
\$30.

Sleeves

dale, Pa., \$139.70; Johnstown, Pa.,
Clearfield, Pa., \$148.50; St. Louis,
\$80; Athens, Tex., \$155.

Nozzles

dale, Pa., \$223.50; Johnstown, Pa.,
\$20; Clearfield, Pa., \$241.40; St. Louis,
\$10; Athens, Tex., \$247.70.

Runners

Reesdale, Pa., \$174; Johnstown, Pa., \$177.80;
Clearfield, Pa., \$185.50; St. Louis, \$187.30;
Athens, Tex., \$191.80.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexi-
co, Mo., \$179; Danville, Ill., \$169.30.
60 Per Cent: St. Louis, Mexico, Vandalia, Mo.,
\$223.00; Danville, Ill., \$213.20.
70 Per Cent: St. Louis, Mexico, Vandalia, Mo.,
\$225; Danville, Ill., \$253; Clearfield, Pa., \$252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue
Bell, Williams, Plymouth Meeting, York, Pa.,
Millville, W. Va., Bettsville, Millersville, Mar-
tin, Narlo, Gibsonburg, Woodville, O., \$14.50;
Thornton, McCook, Ill., \$14.60; Dolly Siding,
Bonne Terre, Mo., \$13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., \$38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace\$14.50-\$15.00
Connellsville, foundry 16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens\$24.00
Everett, Mass., ovens
New England, deld. *26.00
Chicago, ovens 24.50
Chicago, deld. 26.00
Terte Haute, ovens 24.05
Milwaukee, ovens 25.25
Indianapolis, ovens 24.25
Chicago, deld. 28.12
Cincinnati, deld. 25.85
Painesville, O., ovens 25.50
Cleveland, deld. 27.43
Erie, Pa., ovens 25.00
Birmingham, ovens 22.65
Cincinnati, deld. 27.58
Lone Star, Tex., ovens 18.50
Philadelphia, ovens 23.95
Swedeland, Pa., ovens 23.85
St. Louis, ovens 26.00
St. Louis deld. 23.75
St. Paul, ovens 24.00
Portsmouth, O., ovens 26.62
Cincinnati, deld. 25.50
Detroit, ovens 26.50
Buffalo, deld. 23.08
Flint, deld. 28.23
Pontiac, deld. 27.06
Saginaw, deld. 28.58

*Or within \$4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 40.00
Toluol, one deg. 32.00-35.00
Industrial xylol 32.00-35.00
Per ton, bulk, ovens
Sulphate of ammonia\$44-\$47
Birmingham area 45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars.... 18.00
c.l. drums 19.00
l.c.l. drums 19.50

FLUORSFAR

Metallurgical grades, f.o.b. shipping point, in
Ill., Ky., net tons, carloads, effective CaF₂
content 72.5%, \$44; 70%, \$42.50; 60%, \$35.
Imported, net ton, duty paid, metallurgical
grade, \$35-\$36.

ELECTRODES

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GRAPHITE		Per
Diam.	Length	100 lb
2	24	\$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00
CARBON		
40	100	\$3.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	80	8.85
17	84	9.10
17	72	9.10
14	60	9.50
14	72	9.50
14, 12, 10	72	10.30
8	60	10.55



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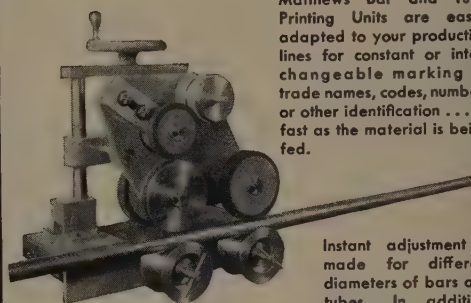
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Scrap Market Sentiment Is Improving

Slightly stronger tone noted at various consuming points despite absence of large buying of dealer grades. Brokers encounter difficulty covering commitments at low prices

Chicago—The scrap market carried a stronger tone here for the second straight week giving rise to the belief some stabilization is either here or imminent. A small sale of No. 2 heavy melting at \$27 a ton was an advance of \$2. No. 1 heavy melting is up \$1 to \$28. Buying of all scrap is light but this is to be expected with the steelmaking rate long further ground.

Philadelphia — Prices on major grades of steel scrap again are unchanged; also on lesser steel items, except for an adjustment in mixed bolts and turnings to \$12 a ton, delivered, and an advance of \$1 in scrap, 2 feet and under, to \$41 delivered.

Meanwhile, cast iron grades are moving slightly upward, following a steady market of several weeks duration. The minimum price of \$34 on No. 1 cupola has disappeared with the market now \$35 delivered. Drop in brown machinery is now \$41 delivered.

Further easing of scrap export restrictions is likely to have little bearing here because of the proximity of domestic consumers, making it more competitive for foreign buyers than at certain other ports.

Cleveland — Despite continued absence of active buying of dealer scrap in this market, prices on some steelmaking and cast grades are up about \$1 a ton sentimentally. The advances result from the fact brokers are having difficulty obtaining material at the low prices offered, and related substantial buying in the Chicago market which involved the movement of some scrap from the Detroit area. Continued deterioration of the Indo-China political situation also is a factor for returning strength.

Detroit — Scrap prices here turned upward somewhat last week as increased buying in the Chicago area resulted in the moving of some material from this district. Boatloads of scrap are reported headed for Buffalo, creating a slight flurry in an otherwise depressed market.

New York — Scrap brokers' buying prices are unchanged, but the thought prevails that once an upward develops prices will advance sharply. Brokers are having difficulty covering on commitments.

Youngstown — Scrap dealers here are concerned about the lack of buying. Reports of growing scrap market strength have been buoying hopes but there has been no evidence of sales here to back up the better feeling.

Pittsburgh — Prices on blast furnace grades generally increased \$1 last week. Higher prices are being paid for superior grades, although demand remains low over-all. Increased activity in neighboring areas is partially responsible for the slight rise here.

Boston — In the absence of buying, steel scrap prices are unchanged. Yard stocks are heavy in most cases and dealers are taking in little tonnage. On what small buying is being done, consumers are limiting freight hauling costs to \$4.

Buffalo — The scrap market here has pulled out of the doldrums with steelmaking grades jumping \$1 per ton and blast furnace items going up as much as \$3.

Cincinnati — The No. 2 grades of open hearth scrap climbed \$1 a ton last week reflecting higher mill prices. Machine shop turnings and short shovel turnings also are \$1 higher.

St. Louis — Stronger undertone marks the scrap market. Rail grades would be higher were it not for uncertainty whether recent heavy mill buying will continue. Minor rises have occurred in steel grades, but they are primarily inter-city price adjustments.

Seattle — The scrap market is slow. Larger buyers are inactive, having well rounded inventories and purchasing occasionally as good offers are made.

Los Angeles — Bethlehem Pacific Coast Steel Corp.'s inventory of 46,000 tons of steelmaking scrap is sufficient for 60 days production. Only small tonnages of steelmaking scrap are moving.

Toronto, Ont. — Canadian scrap steel prices broke another \$1 to \$2 per ton, bringing No. 1 heavy melting and No. 1 bundles to \$22, delivered Hamilton; No. 2 heavy melting and No. 2 Bundles to \$19 and \$17, respectively, and turnings to \$12.

Cast scrap is firmer at \$42 to \$45 delivered. Local dealers report only small supplies of cast scrap.

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP
COMPOSITE

April 8	\$25.33
Apr. 1	24.50
Mar. Avg.	24.37
Apr. 1953	42.88
Apr. 1949	24.06

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting...	24.00-25.00
No. 2 heavy melting...	20.00-21.00
No. 1 bundles	24.00-25.00
No. 2 bundles	18.00-19.00
Machine shop turnings...	11.00-12.00
Short shovel turnings...	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	25.00-26.00
Electric furnace bundles...	24.00-25.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00
------------------------	-------------

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	22.00
No. 2 heavy melting...	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles...	23.00-23.50
Machine shop turnings...	11.00
Mixed borings, turnings...	12.00
Short shovel turnings...	16.00*
Structurals & plate	26.00-27.00
Heavy turnings	20.00
Couplers, springs, wheels...	30.00
Rail crops 2 ft & under...	41.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	39.00
Heavy breakable cast...	36.50-37.50
Unstripped motor blocks...	28.00*
Drop broken machinery...	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	14.00
No. 2 heavy melting...	12.00
No. 1 bundles	14.00
No. 2 bundles	10.00
Machine shop turnings...	4.00*
Mixed borings, short...	6.00*
turnings (structural & plate)	20.00
Los phos.	7.25-8.25
Short shovel turnings...	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks...	21.00-22.00*

Stainless Steel

18-8 sheets, clips...	160.00-165.00
solids	70.00-75.00
430 sheets, clips, solids...	40.00
410 sheets, clips, solids...	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	13.25-15.00
No. 2 heavy melting...	9.25-11.25
No. 1 bundles	13.25-14.25
No. 2 bundles	7.25-8.25
Machine shop turnings...	3.00-3.50
Mixed borings, turnings...	3.00-3.50
Short shovel turnings...	6.50-7.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast...	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	22.00-23.00
No. 2 heavy melting...	19.00-20.00
No. 1 bundles	22.00-23.00
No. 2 bundles	19.00-20.00
No. 1 busheling	22.00-23.00
Machine shop turnings...	10.00-11.00
Mixed borings, turnings...	10.00-11.00
Short shovel turnings...	13.00-14.00
Cast iron borings	10.00-11.00
Low phos., 18-in.	30.00-31.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast...	29.00
Charging box cast	30.00
Drop broken machinery...	40.00

Railroad Scrap

No. 1 R.R., heavy melt.	26.00-27.00
Malleable	32.00-33.00
Rails, 18-in. and under...	42.00-43.00
Rails, random lengths...	34.00-35.00

CHICAGO

No. 1 heavy melting...	27.00-28.00
No. 2 heavy melting...	26.00-27.00
No. 1 factory bundles...	27.00-28.00
No. 1 dealer bundles...	25.00-26.00
No. 2 bundles	17.00-19.00
No. 1 busheling	25.00-27.00
Machine shop turnings...	11.00-12.00
Mixed borings, turnings...	12.00-13.00
Short shovel turnings...	13.00-14.00
Cast iron borings	13.00-14.00
Cut structurals, 3-ft	30.00-31.00
Punchings & plate scrap...	31.00-32.00
Electric furnace bundles...	28.00-29.00

Cast Iron Grades

No. 1 cupola	35.00-37.00
Stove plate	27.00-28.00
Unstripped motor blocks...	24.00-25.00
Clean auto cast	36.00-38.00
Drop broken machinery...	36.00-38.00

Railroad Scrap

No. 1 R.R., heavy melt.	29.00-30.00
R.R. malleable	39.00-40.00
Rails, 2-ft. and under...	41.00-42.00
Rail, 18-in. and under...	42.00-43.00
Angles, splice bars	35.00-36.00
Rails, rerolling	34.00-35.00

Stainless Steel Scrap

18-8 clips & solids...	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	17.00
No. 2 heavy melting...	14.50
No. 1 bundles	18.00
No. 2 bundles	14.50
No. 1 busheling	18.00
Machine shop turnings...	5.50
Mixed borings, turnings...	5.50
Short shovel turnings...	8.50
Punchings & plate scrap...	20.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks...	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting...	23.00-24.00
No. 2 heavy melting...	19.50-20.50
No. 1 bundles	23.00-24.00
No. 2 bundles	17.50-18.50
No. 1 busheling	20.50-21.50
Machine shop turnings...	14.00-15.00
Mixed borings, turnings...	16.50-17.00
Short shovel turnings...	17.50-18.00
Cast iron borings	16.50-17.00
Low phos.	27.50-28.50

Cast Iron Grades

(F.o.b. shipping point)	
No. 1 cupola	34.00-35.00
No. 1 machinery	37.00-38.00

Railroad Scrap

Rails, random lengths...	33.00-34.00
Rails, 3-ft and under...	40.00-41.00
Railroad specialties...	34.50-35.50

BIRMINGHAM

No. 1 heavy melting...	19.00-20.00
No. 2 heavy melting...	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings...	14.00-15.00
Machine shop turnings...	12.00-13.00
Electric furnace bundles...	25.00-26.00

Cast Iron Grades

(F.o.b. shipping point)	
No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	28.00-29.00
Structural, plate 2 ft.	28.00-29.00
Heavy breakable cast...	28.00-29.00
Unstripped motor blocks...	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	23.00-24.00
Rails, 18 in. and under...	39.00-40.00
Rails, random lengths...	32.00-33.00
Angles, splice bars	35.00-36.00
Stand, steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	24.00-25.00
No. 2 heavy melting...	25.00-26.00
No. 1 bundles	24.00-25.00
No. 2 bundles	19.00-20.00
Machine shop turnings...	10.00-11.00
Short shovel turnings...	12.00-13.00

Cast Iron Grades

No. 1 cupola	35.00-37.00
Charging box cast	30.00-31.00
Heavy breakable cast...	30.00-31.00
Unstripped motor blocks...	30.00-31.00
Brake shoes	30.00-31.00
Clean auto cast	30.00-31.00
Stove plate	30.00-31.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under...	40.00-41.00
Rails, random lengths...	30.00-31.00
Rails, rerolling	30.00-31.00
Uncut tires	30.00-31.00
Angles, splice bars	30.00-31.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	30.00
No. 2 bundles	28.00
No. 3 bundles	28.00
Machine shop turnings...	5.50
Mixed borings, turnings...	5.50
Short shovel turnings...	5.50
Electric furnace, No. 1...	30.00

Cast Iron Grades

(F.o.b. shipping point)	
No. 1 cupola	30.00-31.00
Heavy breakable cast...	30.00
Unstripped motor blocks...	30.00
No. 1 wheels	30.00
Stove plate (f.o.b. plant)...	30.00
Brake shoes	30.00

Railroad Scrap

(Delivered consumer plant)	
Rails, random lengths...	30.00-31.00

SAN FRANCISCO

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	30.00
No. 2 bundles	28.00
No. 1 busheling	30.00
Machine shop turnings...	5.50
Mixed borings, turnings...	5.50
Short shovel turnings...	5.50
Cast iron borings	30.00
Structurals	30.00
Heavy turnings	30.00
Punchings & plate scrap...	30.00
Electric furnace bundles...	30.00

Cast Iron Grades

No. 1 cupola	30.00
Charging box cast	30.00
Stove plate	30.00
Heavy breakable cast...	30.00
Unstripped motor blocks...	30.00
Brake shoes	30.00
Clean auto cast	30.00
No. 1 wheels	30.00
Burnt cast	30.00
Drop broken machinery...	30.00

LOS ANGELES

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	30.00
No. 2 bundles	28.00
Machine shop turnings...	5.50

Cast Iron Grades

(F.o.b. shipping point)	
No. 1 cupola	35.00-36.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting...	\$24.00
No. 2 heavy melting...	25.00
No. 1 bundles	24.00
No. 2 bundles	19.00
Machine shop turnings...	10.00
Cast Iron Grades	
(F.o.b. shipping point)	
No. 1 cupola	35.00
Charging box cast	30.00
Stove plate	36.00
Bar crops and plate	28.00
Structural, plate 2 ft.	28.00
Heavy breakable cast...	28.00
Unstripped motor blocks...	32.00
No. 1 wheels	45.00
Rails, random lengths...	32.00
Angles, splice bars	35.00
Stand, steel axles	35.00

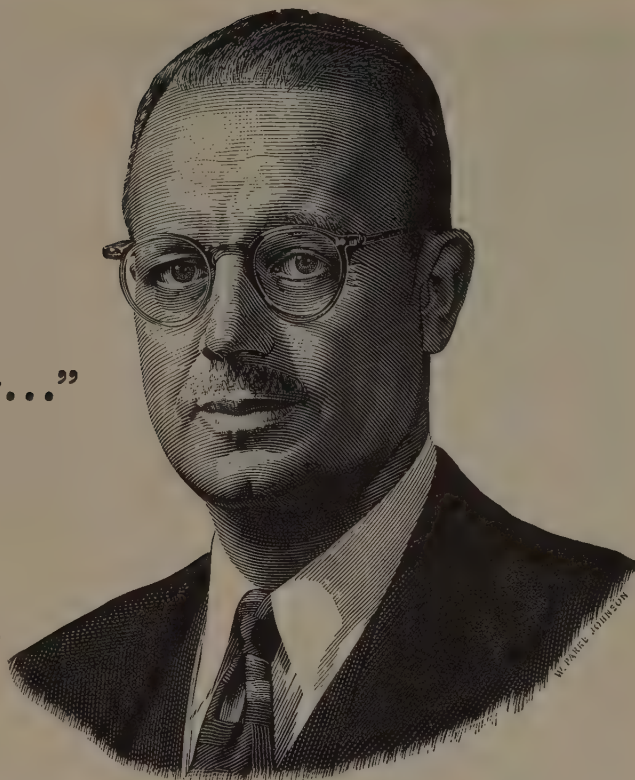
Cast Iron Grades

(F.o.b. shipping point)	
No. 1 heavy melting...	\$24.00
No. 2 heavy melting...	25.00
No. 1 bundles	24.00
No. 2 bundles	19.00
Machine shop turnings...	10.00
Cast Iron Grades	
(F.o.b. shipping point)	
No. 1 cupola	35.00
Charging box cast	30.00
Stove plate	36.00
Bar crops and plate	28.00
Structural, plate 2 ft.	28.00
Heavy breakable cast...	28.00
Unstripped motor blocks...	32.00
No. 1 wheels	45.00
Rails, random lengths...	32.00
Angles, splice bars	35.00
Stand, steel axles	35.00

*"For over twelve years,
the U.S. Rubber Company..."*

HARRY E. HUMPHREYS, Jr.

*President,
United States Rubber Company*



"For over twelve years the United States Rubber Company has offered its employees the Payroll Savings Plan, whereby they can systematically and regularly save in United States Savings Bonds. Over those years, tens of thousands of our employees have joined the Payroll Savings Plan with direct benefits to themselves and their families. Such employees are better employees because with more personal security and freedom from economic worry, there is less absenteeism and personnel turnover, fewer accidents and greater employee responsibility. Such regular investment in Bonds contributes also to the economic strength of the nation. By thus promoting a sounder dollar, business also directly benefits itself. That's why we at United States Rubber endorse the Payroll Savings Plan for Savings Bonds."

Mr. Humphreys cites three important benefits of the Payroll Savings Plan: Payroll Savers build personal security. Production curves reflect serious-minded workers and reduced absenteeism... the national economy is strengthened by a growing reservoir of future purchasing power—more than 49 billion dollars in U. S. Savings Bonds, cash value, held by individuals.

There is still another big advantage in the Payroll Savings Plan: it is easy to install and maintain.

If you do not have the Payroll Savings Plan, or if you have the Plan and your employee participation is less than 60%, here's all you have to do to help your employees, your company and the country:

Write today to Savings Bond Division, U. S. Treasury

Department, Washington, D. C. Tell them you want to join the United States Rubber Company and the 45,000 other companies that are making an important contribution to national security and a sounder dollar.

Your State Director, U. S. Savings Bond Division, will contact you promptly. He will explain the simple procedure of installing the Plan and will show you how to conduct a simple, person-to-person canvass that will put a Payroll Savings Application Blank in the hands of every man and woman in your plant and offices.

That's all you have to do. Your employees will do the rest. They are as interested in their own future as you are in yours. Give them an opportunity to build personal security for themselves and a better America for their children.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and



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Pig Iron . . .

Pig Iron Prices, Page 154

Cleveland—Spotty foundry operations continue. Some shops are on a 5-day week but others are operating only 3 and 4 days weekly. The situation in the foundry trade is best described as one of cautious optimism with some interests noting a slight pickup in castings orders.

Demand for agricultural equipment castings is slightly better, and so is construction equipment, while machine tool castings are reported in continued steady demand.

Despite the slight improvement in sentiment among the foundrymen they are not increasing their demand for pig iron. In fact, they continue to order tonnage from the furnaces as needed.

Boston—Malleable melt is a shade heavier with a few shops moderately increasing operations. Gray iron foundries generally remain on a day week schedule with order backlog light. Melt with steel producers is substantially under capacity.

Iron supply is plentiful, and most furnaces are equalizing with Tryon, N. Y. in larger range of territory.

New York—Business in pig iron has gotten off to a slow start this month. There has been little or no improvement in foundry operations, and some iron sellers doubt the April tonnage movement will be even as good as that in March.

Buffalo—Although pig iron demand continues spotty there is an indication one idle stack here will be highlighted shortly on basic iron. Another producer on merchant iron relighted a furnace but simultaneously withdrew another furnace for relining.

Philadelphia — With four district blast furnaces scheduled to go down this week there will not be the accumulation of iron in sellers' yards that there has been, but indications are there will be no shortage.

Youngstown — U. S. Steel Company banked its No. 2 blast furnace at the Ohio Works due to reduction in business.

Chicago—Some pig iron consumers are holding close rein on their purchases. Since inventories are being maintained at minimum, increased orders for gray iron castings result in foundries seeking quick deliveries on additional lots of iron. There's enough of this going on to keep April volume close to March level.

Of Chicago district's 43 blast furnaces, only 29 are in blast currently.

St. Louis—Pig iron demand, as dropped further with the closing of American Steel Foundries here.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE
NATION'S LARGEST
AND MOST MODERN
PRODUCTION
FOUNDRIES

ESTABLISHED 1866
**THE WHELAND
COMPANY**

CHATTANOOGA 2, TENN.

EFFICIENT PICKLING

with

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RODINE

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Use "RODINE" for improved pickling and increased production!

"RODINE" meets
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Integrated steel plant producing stainless quality alloy steels interested in high grade having college education or equivalent and experience to produce quality steel. Must be of leading and training organization efficiently managing department. Opportunity for man who can meet these qualifications. Reply Box 939, STEEL, Penton Bldg., Cleveland 13, Ohio.

PROCESS CONTROL METALLURGIST
Integrated steel plant, Pittsburgh District. Interested in man with metallurgical education and experience in melting and rolling of steels and alloy steels. Must have experience and qualifications to manage organization of technical men, supervising metallurgical control and processing operations of electric furnace open hearth quality steels. Reply Box 940, STEEL, Penton Bldg., Cleveland 13, Ohio.

ASSISTANT TO PRESIDENT of large machinery manufacturer located in East with experience in manufacture of heavy machinery, administration, technical background and ability to embrace larger responsibilities such as manager. Full details please which will be held in strict confidence. Reply Box 954, STEEL, Penton Building, Cleveland 13, Ohio.

YOUNG METALLURGICAL ENGINEER with sales contact experience for sales and product development work in connection with hot extrusion of alloy and stainless steels. A real opportunity for a graduate metallurgical engineer with good personality who possesses a high degree of judgment, perseverance and drive. Position is with an old established firm rated among the top in its field. Write in confidence for complete and full details to Box 947, STEEL, Penton Building, Cleveland 13, Ohio.

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WANTED—MANUFACTURER'S AGENTS in all parts of the country—by long time manufacturer of hydraulic machinery desirous of increasing participation in this field. Interested persons or organizations possessing sound background in hydraulic press use and application. Write full details to Box 952, STEEL, Penton Building, Cleveland 13, Ohio.

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Diversified background in production management. Also, product, tool, plant, and production engineering. At present managing plant of 400. Desires new position. Excellent references. Reply Box 955, STEEL, Penton Building, Cleveland 13, Ohio.

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Large quantity of new, commercial Marine Armored Electric Cable. In excellent condition. Stored under cover. Write or call W. Vogel, NEW YORK SHIPBUILDING CORPORATION, Camden New Jersey, telephone Woodlawn 3-6700, Extension 589.

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STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

Trap Dust at Source

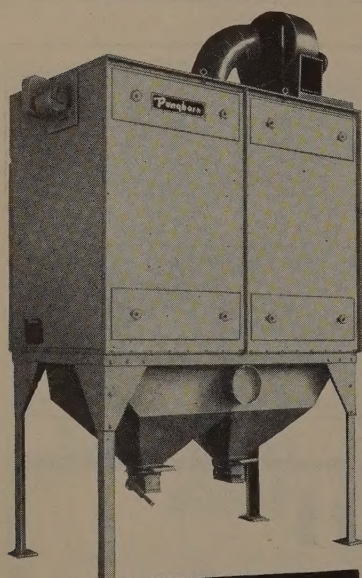
- reclaim material
- eliminate nuisances
- guard employees' health
- minimize machine wear
- cut housekeeping costs

—all by controlling
dust at its source! The answer—

PANGBORN DUST COLLECTORS,

shipped assembled . . . \$286 and up.

For details, write: PANGBORN CORP.
1600 Pangborn Boulevard
Hagerstown, Maryland



Pangborn

DUST CONTROL

Stops the Dust Hog From Eating Profits

Pangborn's 50th Anniversary
1904 - 1954

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New Piercer Outlet Table

improves
concentricity
of tubes

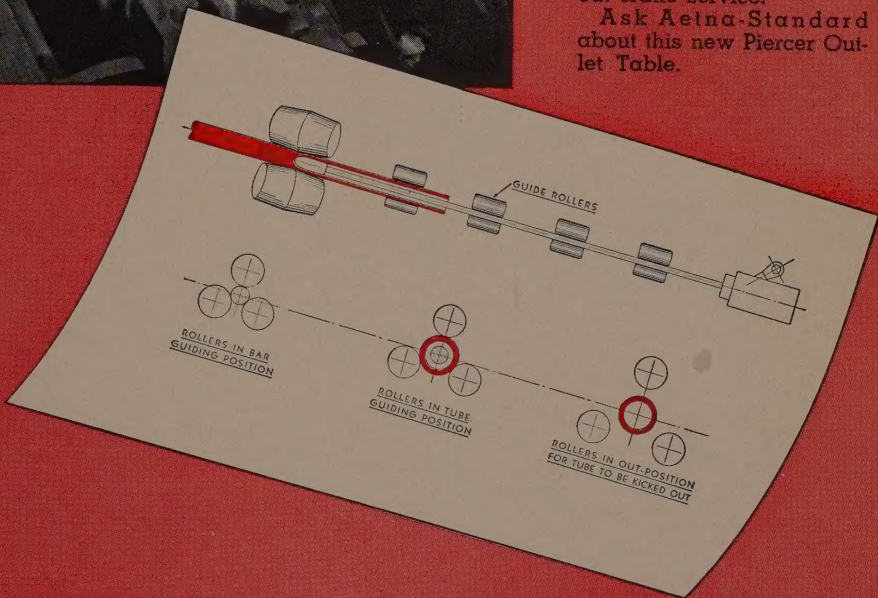
The same rollers guide both piercer bar and tube, assuring three advantages: (1) positive guiding of bar; (2) improved outside tube surface; (3) more uniform concentricity from end to end of tube.

On the operating side, the setting for different rolling schedules (changes in bar or tube diameter) requires only a few minutes... without crane service.

Ask Aetna-Standard about this new Piercer Outlet Table.

features

- Same rollers guide piercer bar and tube (see diagram).
- Guide rollers open automatically for bar guiding to tube guiding position as pierced tube leaves piercing mill.
- Rollers allow quick setting of guide rollers to suit respective mandrel bar and O. D. tube sizes.
- Roller guides are adjustable for full range of piercing mill from minimum diameter bar to maximum O. D. tube.
- Simple, rugged design.



AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

AGENTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

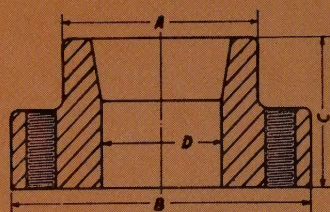
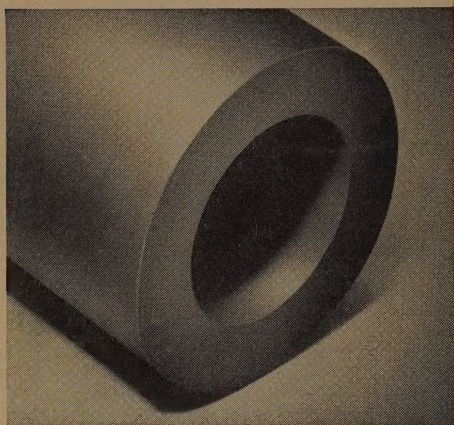
GOOD EQUIPMENT BRINGS DOWN
PRODUCTION COSTS

SUBSIDIARY and ASSOCIATED COMPANIES

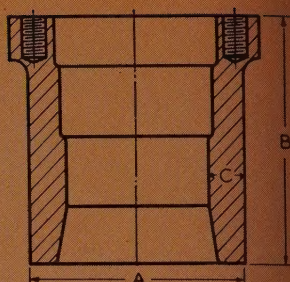
Head Wrightson Machine Company, Ltd., Middlesbrough, England—
Great Britain, Finland, Sweden, Norway, Denmark, Union of South
Africa, Northern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario,
Canada.
M. Castellvi, Inc., New York, N. Y.—Mexico, Central and South
America.
Societe de Constructions de Montbard, Paris, France—France, Bel-
gium, Holland, Luxembourg, Switzerland.
Demag Aktiengesellschaft, Duisburg, Germany—Germany, Austria,
Yugoslavia, Greece, Turkey, Egypt.
Compagnia Italiana Forme Acciaio, Milano, Italy—Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan—Japan.
Hale & Kullgren, Inc., Akron, Ohio—Representative for the Rubber
Industry.
Standard Engineering Company, Ellwood City, Pa.
Trans-World Traders, Pittsburgh, Pa.

Designers and Builders to the Ferrous,
Non-Ferrous, Leather, Rubber, and Plastic Industries

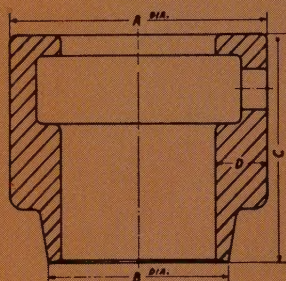
Making ring-shaped tool steel parts?



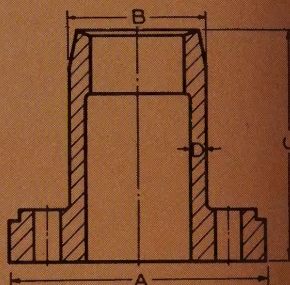
SIZING
DIE



BLANKING AND
FORMING DIE



UPSETTER
DIE



FORMING AND
PIERCING DIE

**New GRAPH-MO HOLLOW-BAR® eliminates
drilling—and machines 30% faster**

BY using Graph-Mo Hollow-Bar®, makers of ring-shaped tool steel parts can start with finish boring. There's no drilling—the hole's already there. Production is speeded up, scrap waste cut and steel saved.

You get all the proved advantages of Graph-Mo, too. Because of the free graphite in its structure, Graph-Mo machines 30% faster than other tool steels and has a minimum tendency to pick up, scuff or gall. And the combination of free graphite and diamond-hard carbides gives Graph-Mo Hollow-Bar exceptional durability. Users report that it outwears other tool steels on an average of 3 to 1.

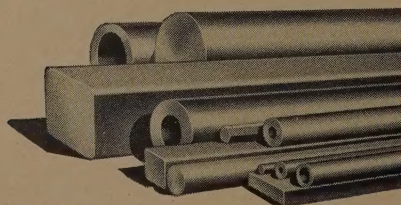
Stability tests prove Graph-Mo is the most stable tool

steel ever made. For example, after 12 years a typical Graph-Mo steel master plug gage showed less than millionths of an inch dimensional change. It responds uniformly to heat treatment, too.

Make sure you're getting all the advantages of Graph-Mo Hollow-Bar if you make ring-shaped tool steel parts. Sizes range up to 16" O.D. with a variety of wall thicknesses. Graph-Mo Hollow-Bar is distributed through Milne and Co. and Peninsular Steel Co. warehouses.

For more information about Graph-Mo Hollow-Bar, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSC"

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